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THE OHIO AND MISSISSIPPI RIVER FLOODS OF JANUARY-FEBRUARY 1937

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[River and Flood Division, Merrill Bernard in charge, U. S. Weather Bureau, Washington, D. C., January 1938]

DRAINAGE BASIN OF MISSISSIPPI RIVER

The Mississippi River drains the greater part of the region between the Appalachian and Rocky Mountains, an area of approximately one and a quarter million square miles, or about 41 percent of the United States. Of this territory the Ohio River drains about 204,000 square miles, or 16 percent of the entire area drained by the Mississippi River. While the Ohio Basin is second in size of the six natural divisions of the Mississippi Basin, it ranks first in importance in the causation of damaging floods. The mean annual discharge of the Ohio is approximately 300,000 second-feet, or about 43 percent of that of the whole Mississippi River System, and while the basin area of the Ohio is only 39 percent that of the Missouri, its discharge is three times that of the latter stream.

A map of the Mississippi River Basin is shown in figure 1, and a detailed description of the physical features may be found in Bulletin E, Weather Bureau, 1897. (This bulletin is out of print. However, file copies may be consulted at Weather Bureau stations and at some libraries.) The principal divisions are shown in table 1. Values for the areas differ slightly from those given in Monthly Weather Review Supplements Nos. 22 and 29, 1922 and 1927, respectively, and result from a redetermination of these areas.

Table 1.—*Grand divisions of the Mississippi Basin*

Designation	Area in square miles	Ratio to whole basin
Ohio Basin	203,950	0.165
Upper Mississippi Basin	188,300	.152
Missouri Basin	521,900	.421
Arkansas and White Basins	188,200	.152
Red Basin	92,200	.075
Lower Mississippi Basin	44,050	.035
Total	1,238,600	1.000

DESCRIPTION OF THE OHIO BASIN

The Ohio Basin, embracing parts of 14 States, is a densely populated region, which is considered to be the highest industrially developed area in the United States. The Ohio Valley is also noted for its rich agricultural lands, with about 30 percent of the area subject to cultivation. The population, according to the 1930 census, is about 17,700,000. Thus, in an area comprising about 7 percent of the entire United States, there is nearly 14 percent of the population. The principal industries are coal mining and manufacturing.

The basin in its longer dimension extends in a southwest-northeast direction from northeastern Mississippi to southwestern New York, a distance of about 800 miles. In its shorter dimension of about 500 miles the basin stretches from northern Indiana southeastward to northern Georgia. Topography varies from flat and rolling country in the northern and western parts to generally rugged and mountainous terrain in the southern and eastern portions. Thus, the northern tributaries, such as the Wabash, Miami, Scioto, and Muskingum, have gentle slopes; while the tributaries rising in the southern and eastern boundaries, such as the Tennessee, Cumberland, Green, Kentucky, Big Sandy, Kanawha, and Little Kanawha, have steep slopes in the headwaters, generally flattening as the lowlands are approached.

The Ohio River proper begins at Pittsburgh, Pa., with the junction of the Allegheny and Monongahela Rivers. From this point the course of the river for 981 miles is in a general southwesterly direction to its confluence with the Mississippi at Cairo, Ill. The river flows through a relatively narrow valley with a gentle slope throughout its length, except in the vicinity of Louisville, Ky., where there is a fall of 26 feet in 3 miles. For the entire length of the Ohio, there is a drop in elevation of about 430 feet, or an average of 0.4 foot per mile.

The Ohio Valley receives a greater annual precipitation than any of the northern tributaries of the Mississippi River, as shown in table 2. The annual amount varies from 80 inches in portions of the mountains in the southeast to 35 inches in the northwestern section. The average annual rainfall is about 44 inches for the basin, compared with 30 inches over the entire Mississippi drainage; and the Ohio Basin, with 16 percent of the area, normally receives 24 percent of the annual precipitation occurring over the Mississippi Basin.

Table 2.—*Weighted normal precipitation (inches and tenths) for the principal basins of the Mississippi River system*

Basin	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Upper Mississippi	1.4	1.3	2.0	2.8	4.1	4.2	3.6	3.4	3.4	2.4	1.8	1.4	31.8
Missouri	.7	.8	1.2	2.0	3.0	3.2	2.6	2.2	2.0	1.4	.8	.8	20.7
Ohio	4.0	3.3	4.3	3.8	4.0	4.2	4.3	3.9	3.0	2.9	2.9	3.6	44.2
Arkansas	1.4	1.5	2.1	3.1	3.8	3.4	3.1	3.2	2.6	2.2	1.7	1.6	29.7
Red	2.5	2.4	3.2	4.3	4.4	3.7	3.2	3.2	2.8	2.9	2.6	3.0	38.2
Lower Mississippi	4.8	4.3	5.1	5.0	4.4	4.2	4.6	4.2	3.2	2.8	3.6	4.9	51.1
Entire	1.8	1.6	2.3	2.9	3.6	3.6	3.2	2.9	2.6	2.1	1.7	1.8	30.1

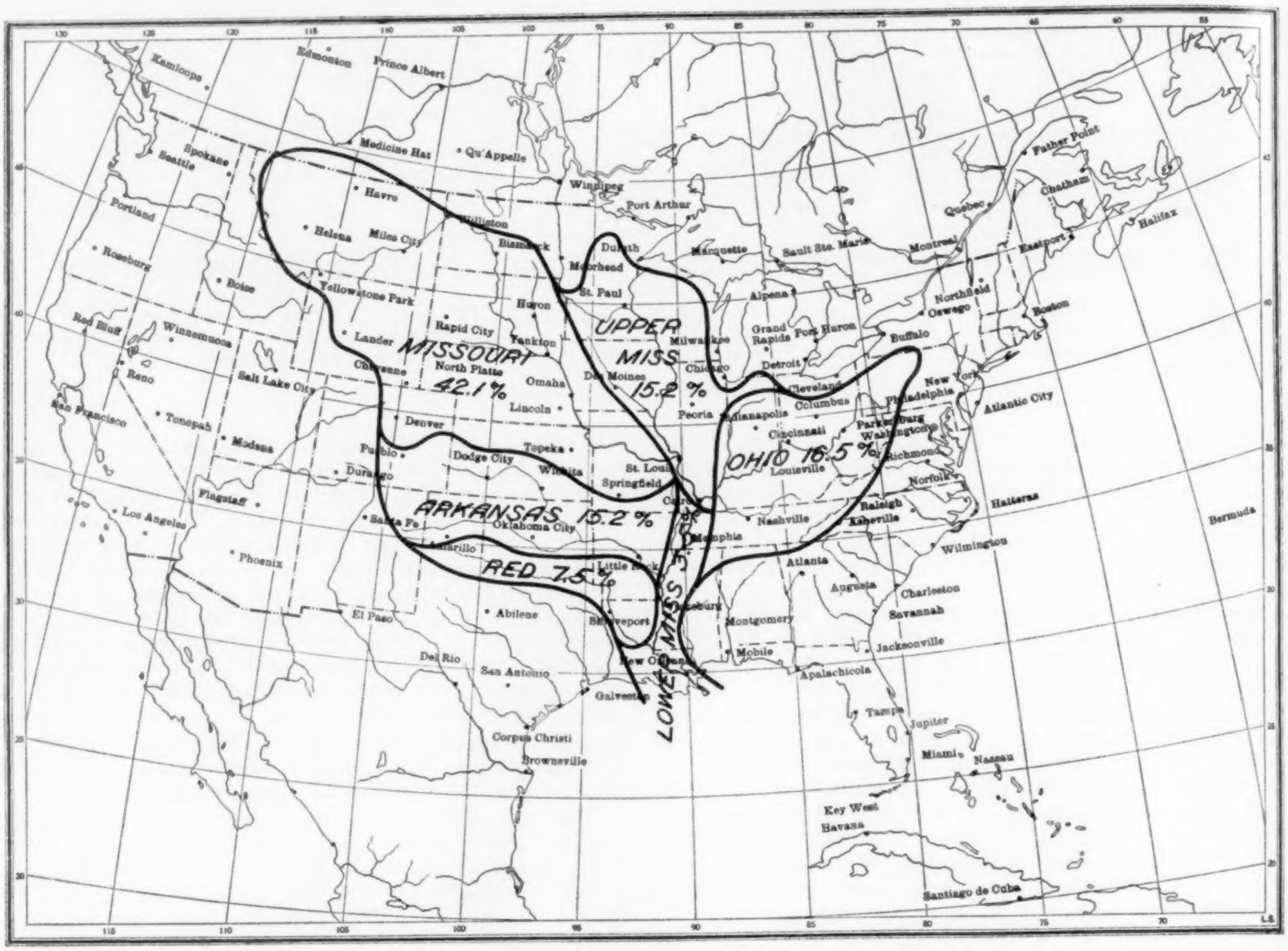

FIGURE 1.—Drainage basin of the Mississippi River.

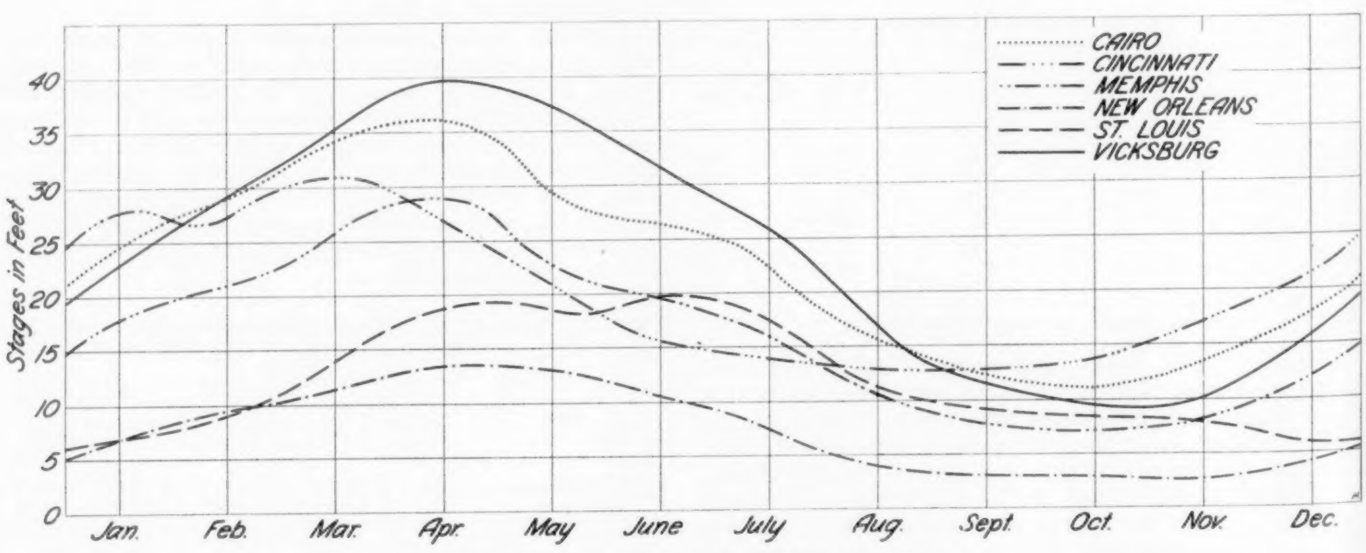

FIGURE 2.—Normal river stages, Ohio and Mississippi Rivers.

An annual rise of the Ohio and lower Mississippi Rivers usually begins about the latter part of December and continues until March and April, when the highest stages are reached (fig. 2). The lowest stages occur during the period August-November, inclusive, the months of least rainfall. All other months of the year have about equal amounts of precipitation. During the late winter and spring continuous rains are the rule and, as they occur during a time when infiltration rates are low, produce a high percentage of run-off. Melting snow may also contribute run-off coincidentally with that from rainfall, adding to the magnitude of the discharge. For these reasons, floods are most likely to occur during the winter and spring, as indicated by the consistent rise in the normal stages shown in figure 2.

HISTORY OF OHIO RIVER FLOODS

Floods before period of systematic observations.—Records prior to 1870 are incomplete and only brief mention is made here of Ohio River floods prior to that year. They are based mostly on records of maximum stages at Pittsburgh and a few other up-river points obtained from various sources and believed to be authentic.

Thus, at Pittsburgh, floods above 35 feet have occurred as follows: 39.2 feet, January 9, 1762; 41.1 feet, March 9, 1763; 35.2 feet, January 1787; 37.1 feet, April 10, 1806; 35.2 feet, November 9, 1810; 36.2 feet, February 1816; 38.2 feet, February 10, 1832; and 35.1 feet, April 19, 1852. The stage of 41.1 feet established in 1763 was the highest stage of record until March 18, 1936, when a stage of 46.0 feet was reached.

The flood of 1832 was also of considerable magnitude in the lower reaches of the Ohio, with stages of 49.5 feet at Parkersburg, 64.0 feet at Cincinnati, 40.8 feet at Louisville, and 46.3 feet at Evansville. A stage of 64.0 feet at Cincinnati was reached in 1810 and a severe flood is said to have occurred there in 1847, although there are no records of the stage.

Floods 1870–1937.—Bulletin Z, Weather Bureau,[1] 1913, pages 12 and 13, gives a history of Ohio River floods for the 40-odd years prior to 1914. The floods of this period are reviewed briefly and the history brought to that date.

Since 1870 daily observations of river stages have been made by the Weather Bureau, Corps of Engineers, Geological Survey, and for a time by the Signal Corps. These records show that prior to 1914 the Ohio River was in severe flood 12 times. Since 1914 the Ohio has experienced 4 great floods, making a total of 16 during the 67-year period of record, or one every 4 years on the average. The criterion for a "severe flood" is taken as a stage of 5 feet or more above flood stage for a length of river reach equal to at least three-fifths of the distance between Pittsburgh and Cairo.

"Flood stage" is the gage elevation at which the river begins to overflow its natural banks in the vicinity of the gage. At Pittsburgh it is 25 feet; Parkersburg, W. Va., 36 feet; Portsmouth, Ohio, 50 feet; Cincinnati, Ohio, 52 feet; Louisville, Ky. (upper gage), 28 feet; Evansville, Ind., 35 feet; Paducah, Ky., 39 feet, and Cairo, Ill., 40 feet.

Technically, a river is considered to be in flood when it reaches the adopted flood stage; but actually, serious damage is in proportion to the height reached by the flood waters above flood stage. In Bulletin Z floods were divided into three classes, namely: (1) Freshets, during which the river does not pass more than about 1 foot over the flood stage; (2) severe floods, to signify stages from 2 to 5 feet or more above flood stage, and (3) great floods, to indicate the greatest recorded floods. After the 1913 flood the maximum known stage of the Ohio River at each gaging station was taken as having a value of 1, other floods being expressed in terms of the maximum stage; thus, 5 feet above flood stage at points between Pittsburgh and Louisville was equivalent to a stage of 0.7 to 0.8 of the maximum stage, while between Evansville and Cairo 5 feet above flood stage was equivalent to 0.85 to 0.90 of the maximum stage. However, since the record-breaking floods of 1936 and 1937, these ratios are changed and a stage 5 feet higher than flood stage is 0.7 to 0.8 of the maximum recorded stage throughout the length of the Ohio River.

[1] A. J. Henry. The Ohio and Mississippi Floods of 1913. Bulletin Z, Weather Bureau, 1913. (Out of print, but may be consulted at Weather Bureau stations and at some libraries.)

TABLE 3.—*Ohio River floods of 5 feet or more above flood stage for previous 67 years*

Year	Pittsburgh (25) [1]		Parkersburg (36) [1]		Portsmouth (50) [1]		Cincinnati (52) [1]		Louisville (28) [1]		Evansville (35) [1]		Paducah (39) [1]		Cairo (40) [1]	
	Stage	Date	Stage	Date	Stage	Date	Stage	Date	Stage	Date	Stage	Date	Stage	Date	Stage	Date
1882			(2)	(2)	(2)	(2)	58.6	Feb. 21	37.4	Feb. 22	44.9	Feb. 24	50.0	Feb. 26	51.9	Feb. 26
1883	31.2	Feb. 8	45.2	Feb. 10	60.5	Feb. —	66.3	Feb. 15	44.4	Feb. 16	47.8	Feb. 19	50.7	Feb. 25	52.2	Do.
1884	36.5	Feb. 6	53.9	Feb. 9	66.3	Feb. 12	71.1	Feb. 14	46.7	Feb. 16	48.0	Feb. 18	54.2	Feb. 23	52.0	Feb. 23
1887			(2)	(2)	(2)	(2)	56.3	Feb. 5	32.6	Feb. 6	43.2	Feb. 8	46.8	Mar. 8	48.5	Mar. 9
1890							56.8	Mar. 1	34.1	Mar. 3	43.9	Mar. 5	48.5	Mar. 11	48.8	Mar. 12
1890					56.0	Mar. 24	59.2	Mar. 25	35.5	Mar. 28	44.4	Mar. 30	47.2	Apr. 2	48.7	Apr. 3
1891	34.5	Feb. 18	44.8	Feb. 21	55.2	Feb. 24	57.3	Feb. 25	32.2	Feb. 27	42.8	Mar. 2	45.5	Mar. 1	46.2	Mar. 4
1893							54.9	Feb. 20	28.8	Feb. 22	41.8	Feb. 24	44.3	Feb. 27	44.9	Feb. 28
1897	32.7	Feb. 24	37.9	Feb. 25	59.0	Feb. 25	61.2	Feb. 26	35.4	Feb. 28	43.6	Mar. 2	50.9	Mar. 24	51.6	Mar. 25
1898	31.7	Mar. 24	48.2	Mar. 26	57.4	Mar. 27	61.4	Mar. 29	36.3	Mar. 30	44.8	Apr. 2	47.3	Apr. 6	49.8	Apr. 6
1899					55.8	Mar. 7	57.4	Mar. 8	32.8	Mar. 10	42.7	Mar. 12	43.8	Apr. 4	46.2	Mar. 30
1901	30.6	Apr. 21	43.9	Apr. 23	58.4	Apr. 26	59.7	Apr. 27	33.3	Apr. 28	41.8	Apr. 30	39.4	May 1	43.2	May 2
1902	35.6	Mar. 1	40.0	Mar. 4							40.0	Mar. 11	39.7	Mar. 15	42.2	Mar. 17
1903	32.1	...do...							28.5	Mar. 9	42.4	...do...	47.6	...do...	50.6	Mar. 15
1904	33.2	Jan. 23	42.4	Jan. 26												
1905	32.2	Mar. 22	42.4	Mar. 23												
1907			40.1	Jan. 21	61.0	Jan. 20	65.2	Jan. 21	41.4	Jan. 22	46.2	Jan. 24	45.7	Jan. 28	50.4	Jan. 27
1907	38.7	Mar. 15	51.6	Mar. 16	60.8	Mar. 17	62.1	Mar. 18	36.0	Mar. 20	43.8	Mar. 23	43.2	Mar. 25	46.2	Mar. 24
1908	33.9	Feb. 16	41.2	Feb. 18	50.9	Feb. 19					41.5	Mar. 14	40.4	Mar. 18	45.6	Mar. 18
1909					51.6	Feb. 27	54.6	Feb. 28	33.0	Feb. 27	43.2	Mar. 1	44.5	Mar. 5	47.3	Mar. 17
1912	31.3	Mar. 22	36.7	Mar. 24	51.0	Mar. 26	53.4	Mar. 27	28.7	Mar. 28	42.6	Mar. 31	49.9	Apr. 8	54.0	Apr. 6
1913	34.5	Jan. 9	45.1	Jan. 13	58.2	Jan. 14	62.2	Jan. 14	39.5	Jan. 15	46.8	Jan. 20	47.6	Jan. 25	48.8	Jan. 26
1913	33.6	Mar. 28	58.9	Mar. 29	67.9	Mar. 31	69.9	Apr. 1	44.9	Apr. 2	48.4	Apr. 5	54.3	Apr. 7	54.7	Apr. 7
1915	31.6	Feb. 3	42.2	Feb. 4	54.7	Feb. 6	55.9	Feb. 7	29.9	Feb. 9	42.6	Feb. 11	42.3	Feb. 11	45.6	Feb. 11
1916									31.2	Jan. 15	43.6	Jan. 18	45.7	Jan. 18	53.4	Feb. 4
1917					54.4	Mar. 16	56.1	Mar. 17	30.5	Mar. 19	42.9	Mar. 22	47.1	Mar. 25	50.1	Apr. 4
1920									31.5	Mar. 23	42.8	Mar. 24	45.3	Mar. 28	51.4	Mar. 31
1922									30.2	Mar. 9	42.9	Mar. 21	48.9	Mar. 24	53.6	Mar. 25
1924	32.4	Mar. 30	40.2	Apr. 1												
1927	29.7	Jan. 23	45.5	Jan. 24	57.2	Jan. 26	59.1	Jan. 26	35.6	Jan. 27	44.8	Jan. 29	44.2	Feb. 6	48.9	Feb. 6
1929									28.4	Mar. 5	42.1	Mar. 11	45.0	Mar. 14	51.8	Mar. 20
1932									29.7	Feb. 5	43.2	Feb. 7	46.8	Feb. 12	49.1	Feb. 15
1933	29.6	Mar. 15	42.4	Mar. 17	60.7	Mar. 22	63.6	Mar. 22	39.1	Mar. 23	45.2	Mar. 27	47.3	Apr. 3	51.9	Apr. 4
1936	46.0	Mar. 18	48.0	Mar. 20	59.2	Mar. 23	60.6	Mar. 28	36.6	Mar. 29	44.4	Mar. 31	48.2	Apr. 7	52.2	Apr. 8
1936	30.6	Mar. 26	40.3	Mar. 28	51.5	Apr. 9	54.0	Apr. 10	31.6	Apr. 12	43.2	Apr. 14	49.1	Apr. 16	52.8	Apr. 15
1937	34.5	Jan. 26	55.4	Jan. 26	74.2	Jan. 27	80.0	Jan. 26	57.1	Jan. 27	53.8	Jan. 31	60.6	Feb. 2	59.5	Feb. 3

[1] Flood stage.

[2] No record.

Severe Ohio River floods occurred in the years 1882, 1883, 1884, 1890, 1891, 1897, 1898, 1901, 1907 (2), 1913 (2), 1927, 1933, 1936, and 1937; of these the floods of 1883, 1884, 1907, 1913, 1936, and 1937 were great floods. Two severe floods occurred in each of the years 1907 and 1913. The record of Ohio River floods, shown in table 3, includes practically all of the severe floods since 1870, with the stages recorded at Pittsburgh, Parkersburg, Portsmouth, Cincinnati, Louisville, Evansville, Paducah, and Cairo. The criterion of a severe flood, as before stated, is a stage 5 feet or more above flood stage, although a few stages slightly less than 5 feet above flood stage have been included. Several changes appear in the table, principally in the stages at Pittsburgh, where the elevation of the zero of the gage was lowered 3.2 feet on March 1, 1926. All stages before that date have been corrected to conform to the datum now in use. Also, the flood stage at Cairo has been adjusted to 40 feet instead of 45 as used prior to January 1, 1933.

The flood of March 1936 established the highest stage ever recorded at Pittsburgh, 46.0 feet. This flood was the result of warm, excessive rains falling on a snow cover in the mountains above Pittsburgh. The storm, confined largely to headwaters of the Ohio above Pittsburgh, did not produce unusually high stages from Parkersburg to Cairo.

In slightly less than a year after this great disaster the still greater flood of January 1937 occurred. Unprecedented amounts of rain fell over much of the Ohio Basin. Stages from 4 to more than 10 feet higher than ever before were recorded along the Ohio River from a point slightly below Point Pleasant, W. Va., to the mouth at Cairo.

CLASSIFICATION OF OHIO RIVER FLOODS

According to magnitude.—Table 4 illustrates that even great floods are more or less local phenomena.[2] It is noted in the table that no particular flood has the same order of magnitude for all of the stations listed.

TABLE 4.—*Year of occurrence of great floods in Ohio River at several points*

Stations	Order of magnitude of 10 greatest floods for previous 67 years									
	1	2	3	4	5	6	7	8	9	10
Percent	14.29	7.14	4.76	3.57	2.86	2.38	2.04	1.79	1.59	1.43
Pittsburgh, Pa.	1936	March 1907	1884	1902	1891, January 1913, 1937	1908	March 1913	1904	1897	1924
Parkersburg, W. Va.	March 1913	1937	1884	March 1907	1898	1936	1927	1883	January 1913	1891
Portsmouth, Ohio	1937	March 1913	1884	January 1907	March 1907	1933	1883	1936	1897	1901
Cincinnati, Ohio	1937	1884	March 1913	1883	January 1907	1933	January 1913	March 1907	1898	1897
Louisville, Ky.	1937	1884	March 1913	1883	January 1907	January 1913	1933	1882	1936	1896
Evansville, Ind.	1937	March 1913	1884	1883	January 1913	January 1907	1933	1882	1898 1927	1890 1936
Paducah, Ky.	1937	March 1913	1884	1897	1883	1882	1912	1936	1922	1890

It is desirable to have some method to compare the great floods of record since 1870 in the Ohio River, as a whole, instead of at individual points. For this purpose the seven stations listed in table 4 have been selected to represent the entire Ohio River as they are fairly well distributed throughout its length. Cairo has not been used in this computation as it reflects the influence of floods in the Mississippi River.

The greatest flood is assumed to be one surpassing all others at all of the seven points, or along the entire reach of the river, and would have a rating of 100 percent; a flood occupying second place at all points, 50 percent, etc. Inasmuch as seven stations are being considered, a flood at each of these points would be assigned a value of 14.29 percent for first place, 7.14 percent for second place, 4.76 percent for third place, etc. A flood not ranked among the first 10 is assigned a value of zero. Adding the values of any flood at all points will give the rating for the particular flood. By use of this method the 1937 flood ranks first with a rating of 81.45 percent; the March 1913 flood, second with 47.27 percent; the 1884 flood, third with 38.08 percent, etc. The 10 greatest floods listed in table 5 are rated according to this scheme. The eight greatest are presented graphically in figure 3.

According to cause.—A classification proposed by Henry,[3] under which floods are divided into three groups, follows:

The first group consists of floods caused by a continued period of excessive rain over an extensive area during an open winter. This is the most common cause of Ohio River floods. Of the 16 severe floods since 1870 the following may be listed in this group: 1882, 1883, 1890, 1891, 1897, 1898, January 1907, January 1913, 1927, 1933, and 1937. These floods were, in the main, caused by prolonged periods of rainfall during January, February, and March, and in some cases continuing into April and May. The flood of January 1937 was unusual in that the entire rainfall was confined to a period of 31 days.

TABLE 5.—*Relative order of magnitude of 10 great Ohio River floods*

Order of magnitude	Year	Rating (percent)	Order of magnitude	Year	Rating (percent)
1	1937	81.45	6	March 1907	15.36
2	March 1913	47.27	7	January 1913	11.73
3	1884	38.08	8	January 1907	11.67
4	1936	23.27	9	1933	8.84
5	1883	17.40	10	1897	8.18

The second group includes floods caused by rain and melted snow. Typical of this group are the floods of February 1884, April 1901, March 1907, and March 1936.

The third group includes floods caused by torrential rains over a limited area during a comparatively short period of time. The flood of March 1913 is the only one under this classification.

CAUSES OF THE 1937 FLOOD

The record-breaking flood of January–February 1937 in the Ohio Valley actually had its beginning in the latter part of December, when moderate to heavy rains occurred. After several months of comparatively low stages, a general rise began in the lower portion of the river during

[2] A. J. Henry, The Distribution of Maximum Floods, Monthly Weather Review, 1919, vol. 47, p. 864.
[3] A. J. Henry, The Ohio and Mississippi Floods of 1913, Bulletin Z, Weather Bureau, 1913 (see note, p. 3).

the last week of December and developed within a month into the greatest flood of record.

The immediate cause of the flood was the unprecedented amount of rainfall during the month of January. Rain fell intermittently throughout the first 25 days of the month, but during the latter part of this period excessive rainfall was almost continuous.

An interesting feature of the storm period, aside from the unusual amount and duration of rainfall, was the location of the zone of heaviest precipitation. The zone extended from central Arkansas northeastward to south-central Ohio (see figs. 5–11) and almost paralleled the Ohio and lower Mississippi Rivers. The critical position of the storm, made up of a series of closely related downpours which persisted for several days at a time without moving very far from the axis of the zone, contributed much to the severity of the flood.

Conditions prior to the flood.—Conditions prevailing throughout the months of October, November, and the first 3 weeks of December gave no indication of the unusual flood that was to follow. The average precipitation over the Ohio Basin during this period was approximately normal. The October precipitation was only slightly higher than normal. November was quite dry over the basin except for a period of rainfall during the first week, in which the heaviest amounts occurred over Indiana and portions of Illinois and Ohio. This rainfall resulted in high stages in the Wabash River Basin and on the lower Ohio River, where the mean stage at Cairo for the month was 17.4 feet as compared with a 60-year normal of 13.4 feet. However, during the latter part of November and the first 3 weeks of December precipitation was deficient over most of the Ohio Basin, so that by the beginning of the last week of December low stages prevailed along the entire river and practically all of its tributaries.

The stages at selected stations along the Ohio and Mississippi Rivers at the time of the beginning of the flood, as well as a comparison of the mean stages for December 1936 with the normal, are shown in table 6. The stages on December 25, as well as the means for the month were, as a rule, well below the normals for December in these rivers. The stage at Cairo was 12.9 feet on December 25. The mean stage for the month was 14.5 feet, while the normal is 17.9 feet. At St. Louis the stage on the same date was 2.9 feet below zero compared with a normal for December of 5.9 feet above zero; and on December 17 the lowest free-water stage of record for the month of December was reached when the river dropped to 3.7 feet below zero. An all-time record was established on the Missouri River when a stage of 2.7 feet below zero was reached at Kansas City, Mo., on January 9 and 11, 1937.

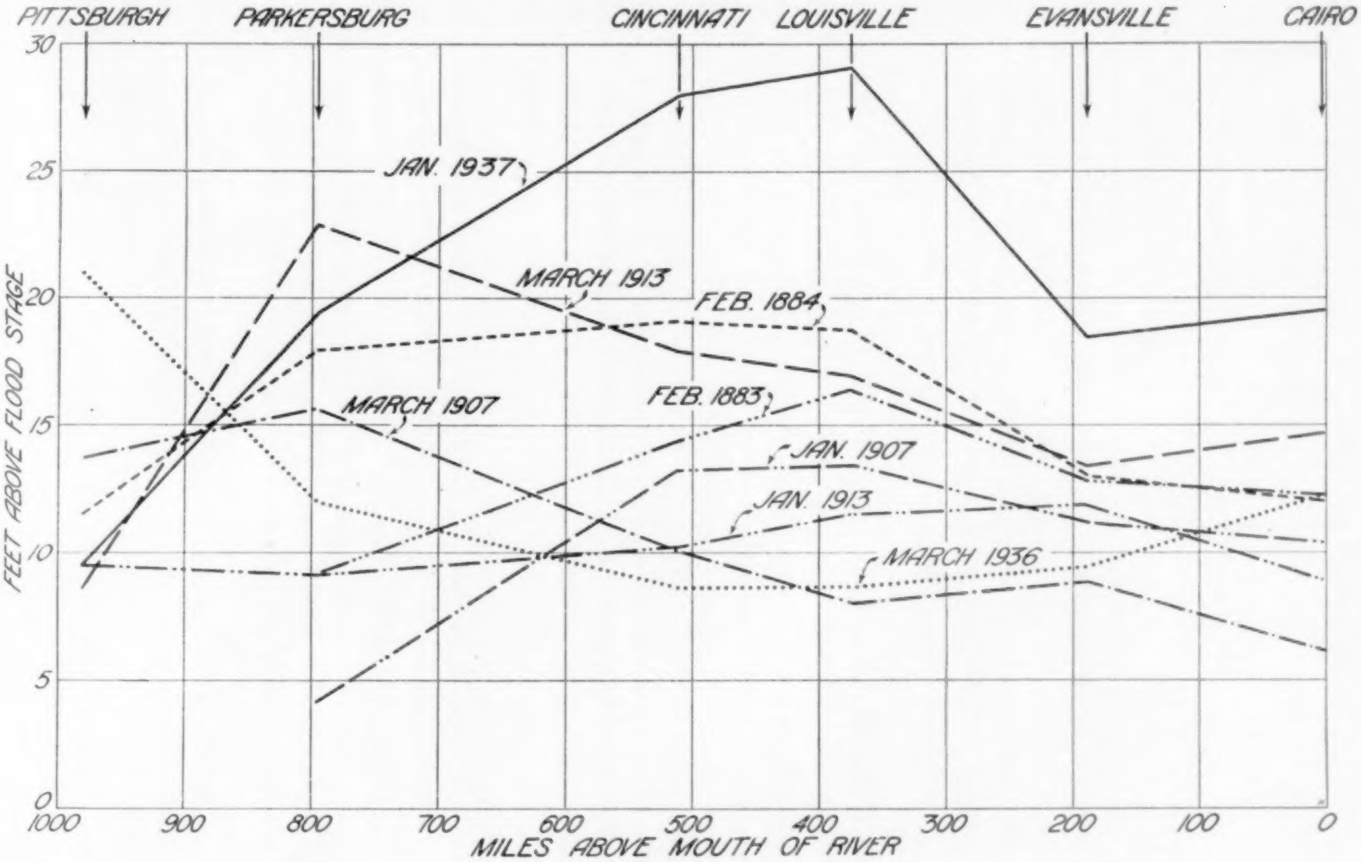

FIGURE 3.—Crests of Ohio River floods.

TABLE 6.—*Stages on Dec. 25, 1936, in comparison with the normal on the Ohio and lower Mississippi Rivers*

Station	Flood stage	Mean stage December 1936	Stage on Dec. 25, 1936	Normal stage for December
Ohio River				
Pittsburgh, Pa.	25	14.2	13.5	13.4
Cincinnati, Ohio	52	(1)	21.1	21.4
Cairo, Ill.	40	14.5	12.9	17.9
Mississippi River				
St. Louis, Mo.	30	−1.4	−2.9	5.9
Memphis, Tenn.	34	7.6	7.5	12.0
Vicksburg, Miss.	43	6.2	10.0	15.8
New Orleans, La.	17	1.9	1.9	4.1

[1] River in pool part of month.

TABLE 7.—*Daily amounts of precipitation (inches and hundredths) at selected stations in the Ohio River watershed, Dec. 25, 1936, to Jan. 25, 1937*

[T=Trace, or less than 0.01 inch precipitation. Precipitation for 24 hours ending near sunset unless otherwise indicated]

	December 1936							January 1937																									Total
	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
ILLINOIS																																	
Central Division																																	
Casey			0.70		0.02	1.98			0.31					1.17	0.40	0.89	0.18			0.35	1.71						0.75	0.48	0.20		0.60		9.74
Charleston			.70		T	1.71			.21	T				1.43	.48	.89	.19			.28	1.34	0.03		T			.27	.21	.25		.43		8.42
Effingham			.65			.94			.18					1.15	.40	.34	.30			.15	1.45			0.10			.20	.55	.30		.40		7.11
Hoopeston			.79			1.76			.14	T				.96	1.04	.65	.08			.63	.59	.12					.15	.04	.30		.25		7.50
Newton			.45		.03	1.40			.26					1.72	.27	.94	.17			.35	2.14			.07			1.01	1.03	.58		.58		11.00
Palestine			.34		.02	1.27			.20				T	1.60	.12	.68	.63			.30	2.55	.06		.10	0.03		1.00	1.35	.61		.52		11.38
Pana		T	.34		.05	1.80			.12	T			T	1.30	.58	.50	.10			.39	1.02	.13		.02			.14	.14	.25		.07		6.95
Paris			.67			1.70			.15	T				1.60	.40	.75	.15	0.20		.35	1.35	T		.05			.40	.70	.36		.33		9.16
Tuscola		0.04	.45		T	1.84	0.03		.28				0.01	1.51	.74	.54	.09		T	.43	1.01	.02					.15	.18	.26		.24		7.82
Urbana		.02	.67		.01	1.96			.25	0.02				1.99	.91	.39	.08			.60	.70	T		T			.11	.22	.18		.22		8.33
Southern Division																																	
Anna	T		.50	T	T	1.35			.30				.34	T	.48	1.65	.60		T	.27	3.75	T		.28		T	1.27	1.10	1.75		.92		14.56
Benton			.50		.04	1.38			.20					.88		1.43	.48			.10	4.20	.14		.09			.70	1.73	1.06		.67		13.60
Brookport [1]			T	0.52	.03	.12	.96		.43					1.25	T	1.15	1.65	T	T	T	.30	1.46		.35	1.57		.12	3.75	3.35	1.40	1.00	1.25	20.66
Cairo [2]	T		.83	.01	.16	1.28		0.22	.08			T	.96	T	.29	1.38	.40	T	T	.29	1.68	T	T	1.88	.02	T	2.40	2.32	1.76	T	1.43		17.39
Carbondale	T		.54	T	.02	1.34			.20				.26	.59	.12	1.66	.54			.08	4.78	.06		.13	.12		.68	1.63	1.30		.72		14.77
Carmi			.43		.05	1.89			.14				.21	.29	.10	1.95	.34			.39	4.58	.06		.65	.75		2.27	1.89	1.06		1.33		18.38
Chester [1]			.15	.01	T	.32	.54	T	.29					1.64	.18	1.30	.34			T	.94	1.29			.01		.14	.48	1.52	.42	.07	.48	10.12
Du Quoin			.29	T	T	2.36		.10	.13				.08	1.04	.29	(3)	1.10			.96	2.19	.01		.02	.03			(3)	(3)	3.86	T		12.46
Edwardsville		.03	.39	T	.07	.66			.28				T	1.51	.89	.56	.19		0.02	.19	1.24	.02	T	.07			.19	.12	.49		.10		7.02
Fairfield			.31		.04	1.70			.21				T	1.34	.09	.90	.26			.08	3.10	.17		.07	.04		.47	2.06	.99	.10	.60		12.53
Flora			.23		T	.98			.27					2.32	.20	.97	T			.18	1.70	.17					.65	1.63	.33		.56		10.19
Golconda [1]			T	.56	.03	.09	1.18		.34					1.12		.98	1.44	T		T	.50	1.99		.19	1.85		.12	3.87	2.45	1.65	.66	1.24	20.26
Grand Chain [1]		T	.06	.79	T	.31	.82		.48					.76	T	.97	1.45	T		T	.96	2.30		.36	1.76		.20	3.10	1.99	1.76	.55	.95	19.57
Greenville		T	.45	T	T	1.56			.30				T	1.50	.65	.97				.28	1.30	.08		.10			.20	.80	.30				8.49
Harrisburg	T		.78			1.73			.27					.38	.04	1.19	.70				3.84	.18		.22	1.29		1.14	2.34	2.00		1.43		17.53
McLeansboro			.54		.02	1.66						0.05	T	.74	.01	1.48	.51			.10	4.40	.16		.05	.36		.55	1.50	1.45	.02	.80		14.49
Mascoutah			.32		.01	1.08			.41				.01	1.44	.64	.68	.04	T	T	.22	1.22	.03		.07			.08	.16	.46	T	.11		6.98
Mount Carmel [1]				.31	.02	.46	2.11		.32	T				.31	.01	1.28	.76			T	3.07	1.81		.10	1.00		.26	1.89	.90	.81	.29	.73	16.44
Mount Vernon			.30		.05	1.30							.35	1.65	.32	.90				.55	3.65			.11			1.00	.90	.95		.70		12.73
Nashville			.35			1.27			.39					2.62	.33	.68	.42			.15	1.37	.10					.19	.64	.45		.58		9.54
New Burnside	T		.90	.02	.02	1.52	T		.29				.02	.49	.15	1.44	.83	.01	T	.04	3.93	.34		.24	1.39		.94	3.00	1.90	.15	1.52	.10	19.24
Olney			.46		.04	1.11			.32				T	2.02	.11	.79	.54	T		.23	2.70	.10		.05	.04		.60	1.62	.94	.02	.58		12.27
Salem			.46		.03	1.49			.27				T	1.98	.26	.78	.35			.11	1.57	.08		.03			.38	.73	.67		.52		9.71
Sparta	T		.08		T	1.22			.38				.09	2.09	.36	.84	.31			.03	1.62	T		.03			.28	.93	.71		.51		9.48
Waterloo			.34	T	.13	1.04			.34				.05	1.61	.63	.61	.16	T		T	1.29	.03		.02			.04	.55	.44		.19		7.47
INDIANA																																	
Northern Division																																	
Albion [1]		T	T	.57		.53	.64			.21	0.02			.03	.74	.64	.09				.64	.38	T		.14		T	.48	.30	.10	T	T	5.51
Angola			.52		.03	1.50	.01		.05	.03				.29	.60	.41	.08	T		.55	.40	.10	T	.03	T		.12	.65	.30		.20		5.87
Berne		T	.33			1.00	.57		.02	T				.86	.11	.47	.25			.32	1.94	.28		.08	.22		.08	.76	.44		.34	T	8.07
Bluffton [1]			T	.46	.06	.59	1.11		.02	T	T			.26	.63	.53	.18			T	1.02	.89	0.02	.02	.09		.02	.87	.37	.23	.01	.35	7.73
Collegeville		T	.72		.01	2.05			.17	.01				.35	.69	.29	.03			.43	.39	.05		T	T		.13	.17	.15		.07		5.71
Columbia City			.29		.03	.76			.12	T			.72	.08	.55	.13				.73	1.27	T		T			.32	.29	.21		T		5.50
Decatur [1]			.17			.67	.82			.03				.05	1.10	.55	.06				1.01	.81			.18		.02	.81	.31	.48		.33	7.40
Delphi			.08	.05	T	2.00			.16	T				1.44	.80	.60	.10			.59	.66	.05		T	T		.30	.10	.60		.33		7.86
Fort Wayne [2]			.62		.01	1.49			.11	T			T	1.23	.87	.13	T	T	T	.97	.70	.04		.04	.02		.68	.20	.36		.40		7.87
Fowler	T	T	.47		T	1.30								1.50	.50	.50	.20			.70	.57	.21		T			.12	.15	.40		T		6.62
Huntington			.65			1.47	.17		.07					.85	1.00	.55	.10			.60	.75	.27		.15			.27	.62	.60		.30		8.42
Kokomo			.85		.02	1.30	.10		.02	T				1.08	.67	.48	.15			.28	1.12	.14		.03			.13	.01	1.06		.50	.02	7.96
La Fayette [1]	T			.32	T	.37	1.32		.03	.11	T			.22	1.94	.85	.10				.55	.72			.01		.04	.22	.32	.22	T	.33	7.61
Logansport [1]			.02	.46	.01	.50	.95		.03	.03	.02			.12	1.47	.71	.14				.69	.65			.06		.02	.46	.28	.18	.04	.05	6.87
Marion [1]			.54		.02	1.15	1.08		.01	.02	.03			.82	.34	.51	.18			.23	1.48	.38		.03			.13	.64	.46		.36		8.49
Monticello (near) [1]			.02	.40		.58	1.52		.08	.06				.09	1.33	.80	.10				.54	.76			.03		.06	.10	.25	.03		.28	6.97
Rochester			.72		T	1.62			.02	T				.30	.70	.55	.07			.51	.35	.11		.04			.16	.10	.28		.19		5.72
Wabash [1]			.16	.57	.02	.78	.62			.10	T			.24	1.48	.86	.10				.56	.74			.08		T	.69	.30	.35	T	.40	8.05
Winamac			.80		T	1.12			.03	.02				.40	.88	.30	.02			.61	.40	.05		.03			.30	.09	.20		.20		5.45
Winona Lake			.72			1.35			.03	T				.21	.65	.45	.12			.47	.43	.26		.04			.06		.36		.20		5.35
Central Division																																	
Anderson			.41			.60	.75			T				.77			1.02			.10	2.96	.55		.06	.24		.07	.95	.72		.42		9.62
Bloomington [1]				.38	.10	.11	1.94		.17					.98	.88	1.04	.85	T	T	.05	2.22	1.30		.08	1.18		.08	3.38	.70	.51	.07	.97	16.99
Cambridge City			.32		.06	.48	.72		.08					.76	.02	.54	.78			.25	2.48	.73		.07	1.18		.21	2.18	.63		1.02	.18	12.69
Covington [1]				.46		.68	1.12		.11	.03	.01			.44	1.47	1.17	.10				.47	.89			.02		.08	.14	.20	.15	T	.34	7.88
Crawfordsville			.46			1.71				T				1.16	.42	.75	.17			.40	1.31	.22		.05			.18	.68	.48		.40		8.39
Farmersburg			.34		T				.03					1.32	.16	.74	.32			.27	2.32	.34		.09	.02		.36	1.32	.52		.52		8.67
Farmland			.49		T	.27	1.17		.06	T				.71	.04	.57	.44	T		.11	2.76	.12		.65	.77		.06	1.30	.63	.33	.14	.41	11.03
Frankfort			.51		.02	1.76			.07	T				1.00	.45	.57	.10			.29	1.27	.05		.20	T		.26	.76	.31		.20		7.82
Greencastle			.47			1.54			.05	T				1.22	.27	.54	.27	T		.43	3.07	.07		.20	.05		.53	.84	.54		.48		10.57
Greenfield			.50		T	.47	.74		.07	T				.82	T	.62	.48			.19	3.36	.30		.06	.72		.16	1.33	.67		.55	T	11.04
Hickory Hill			.40		T	.57	1.57		.07	T				2.30	T	1.00	.80			T	3.25	.35		.05	.98		.55	3.91	.90		.98	.10	17.78
Indianapolis [2]			.48		.01	1.94			.04	T			.06	.99	.38	.40	.07	T		1.28	1.77	T	T	.31	T		1.05	.69	.37		.44		10.28
Martinsville [1]				(3)	(3)	(3)	2.50		.14					.70		.17	.29			.32	2.25	1.10	.09	.21	.78	0.12	.24	1.20	.90	.72	.06		11.79
Mauzy			.39		.02	.59	.35		.04	T			T	1.00	.01	.73	.75			.12	3.20	.19		.16	.99		.32	2.35	.77	.02	1.13	.12	13.25
Muncie			.32	T	T	.72	.73		.05	T				.67	T	.60	.43	T	T	.29	3.07	.30		.17	.29		.16	1.21	.56		.41	.08	9.97
Noblesville [1]			T	.55	.05	1.10	1.16		.12	.04	T			.20	.76	.72	.38			T	1.86	1.04		.04	.15		.01	1.04	.48	.21	T	.38	10.29
Richmond [2]			.36		.06	.85			.03	T			.02	.80	.02	.70	.43			.60	2.79	.01		1.01	.27		2.02	1.41	.50		1.29		13.17
Rockville			.55		.02	1.68		T	.11	T			T	1.38	.50	.70	.24			.40	1.73	T		.07			.92	.25	.40		.49		9.44
Salamonia			.29		T	.25	1.02		T	T			T	.64	T	.56	.59			.06	3.71	.36		.12	.71		.16	1.15	.80	.02	.40	.12	10.96
Shelbyville			.34		.01	.65	.45		.08					1.10	.01	.92	.70			.05	3.35	.15		.12	1.05		.30	3.06	.75		1.11	.06	14.26
Terre Haute [2]			.54	T	.03	1.64			.13	T			.12	1.08	.96	.52	.02	T	T	1.14	1.75	T		.09	T		1.52	.62	.36		.51		11.03
Veedersburg			.58	.05	T	1.15				T				1.40	.62	.95				.35	.93	.15					.29	.23	.70		.58		7.98
Whitestown			.60		.05	1.76	.05		.06	T				1.02	.31	.76	.33		T	.31	2.46	.12		.08	.05	T	.26	1.28	.61		.45	T	10.56

[1] Precipitation for 24 hours ending in the morning.
[2] Precipitation for 24 hours ending at midnight.
[3] Included in the next following measurement.

TABLE 7.—*Daily amounts of precipitation (inches and hundredths) at selected stations in the Ohio River watershed, Dec. 25, 1936, to Jan. 25, 1937*—Continued

	December 1936							January 1937																									Total
	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
INDIANA—continued																																	
Southern Division																																	
Bedford		0.46	T	0.05		0.66	0.49		0.13				T	0.75	T	1.07	0.32			0.28	3.85	0.54	0.09	0.20	1.54		0.56	2.49	1.18	0.10	1.00	0.10	15.86
Boonville			.21		0.05	.50	.54		.39			T	.08	.40	T	1.75	.40			T	3.25	.41		.39	1.75		.76	4.02	3.62	.33	2.01	T	20.86
Brookville			.27		.04		.92		.15					.86	.18	.64	.58				1.66	1.41		.07	1.53		.16	2.03	1.18	.64	.34	1.16	13.82
Butlerville			.41		.11	.08	.88		.30				T	.54	.03	1.10	.31			.05	2.75	1.05		.24	1.87		.61	3.14	1.31	.68	1.57	.20	17.23
Columbus			.35		.04	.58	.76		.17					1.19	.01	1.08	.42			.09	3.31	.40		.18	1.29		.65	2.34	1.02		1.56		15.44
Cypress [1]				.21	.04	.01	.58		.30	0.01				.76		.82	.51	0.02			.57	2.94		.12	2.05		.33	2.96	2.08	.53	.51	1.40	16.75
Edwardsport [1]				.30	.02	.44	1.78		.14	T	T			1.40	.35	1.00	.47			.05	2.00	1.21		.21	.76		.07	1.85	.52	.58	.10	.60	13.85
Elliston [1]			.05	.25	T	.40	1.70		.12					1.25	.65	.89	.95			.05	2.07	1.25		.10	.65		.06	1.90	.80	.30	.35	.62	14.41
Evans Landing [1]				.56	.02	.20	1.01		.72	.02				1.15		.34	2.15	.64		.04	.35	1.92		.28	1.85	T	.30	2.63	2.10	1.75	2.35	2.00	22.38
Evansville [2]			.25	T	.01	.59		0.16	.12				.42	.01	.22	1.23	.05		T	.13	2.79	.01		2.07	.02	T	2.42	2.05	1.04		1.83		15.42
Forest Reserve			.37	T	.10	.04	.65		.42				.03	.35	T	1.22	.47	T	T		2.57	1.28		.22	1.78		.88	2.98	2.17	.51	2.07	.44	18.55
Greensburg [1]			.08	.50	.12	.08	.75		.09	.02	T			.85	.30	.65	.70			T	2.30	1.35		.06	1.43		.07	3.30	.91	.65	.03	1.20	15.44
Hazleton [1]			T	.25	T	.29	1.78		.26	T				.24		1.20	.68			T	2.56	1.53		.12	1.10		.23	1.98	.76	.70	.12	.63	14.43
Jeffersonville			.50	.03	.27	.16	.60		.52				.26	.85	1.24		1.65			.12	2.62	.36		.66	1.48		1.10	3.71	1.98	1.25	2.94	.16	21.86
Johnson			.28		.11	1.43			.28					.33		1.53	.54	T	T	.23	4.26	.60		.25	1.63		.62	3.21	1.17	.11	1.43	.11	18.12
Leavenworth [1]				.40	.05	.02	.78		.27	.02				1.10		.40	1.50	.24		.02	.40	2.05		.19	1.82		.14	3.25	3.10	2.90	.75	2.18	21.58
Madison [1]				.45	.06	.11	.71		.30	.10				.39	T	.29	1.25	.03			.39	3.55	T	.20	1.88		.18	2.68	2.36	1.05	.86	1.98	18.82
Marengo				.47	T	.30	.95						.37	.45	T	1.10	.47			T	2.90	.90		1.10	2.10		.70	3.35	2.00		1.25	.21	18.62
Moores Hill			.74		T	T	.94		.36				T	.56	T	1.09	T				2.41	.95		T	2.23		.68	2.49	.92	.20	1.96		15.53
Mount Vernon		.30	.33	.02	.10	.46	.56		.30				.02	.40	T	T	.88			1.23	3.30	.25		.60	1.48		.94	3.10	2.77	.20	1.48		18.72
Newburg [1]				.32	.02	.01	.92		.36	T			T	.62		.96	.75	.22		.03	1.02	2.00	.01	.11	2.54		.24	2.85	1.78	.50	.52	1.75	17.53
New Harmony [1]			T	.43	T	.27	1.32		.27	T				.39		1.04	1.05			T	2.75	2.56		.10	1.70		.43	2.18	1.35	.80	.53	.95	18.12
Paoli			.76		.02	.25	.72		.19				T	.26	T	1.11	.74			.04	4.01	.49		.24	2.08		.79	2.93	1.65	.28	2.19	.16	18.91
Petersburg [1]			.10	.22	.02		.91		.20					.24		1.19	.77			T	2.92	1.56		.14	1.90		.51	2.30	1.08	.40	.65	.68	15.79
Princeton			.38		.07	1.26			.08					.58	.04	.46	1.66				3.80	.24		.94	1.11		1.77	1.80	1.96		.65		16.80
Rome			.60	.02	.08	.17	1.30		.45				.25	.80		1.25	1.50			.05	.90	1.00		1.00	1.70		1.00	4.10	2.42	.62	2.38	.16	21.75
Salem			.45		.08	.43	.65		.22					.32	.04	1.40	.20	.11		.28	3.50	.40		.24	2.20		.79	3.16	1.80	.30	2.07	.20	18.84
Scottsburg		T	.57		T	.20		.21	.89				T	.41	.03	1.64	.34	T		.03	3.26	.73		.34	1.64		.90	3.64	1.49	.20	1.30	.11	17.93
Seymour [1]				.31	.06	.10	.72		.22					.38	.04	.78	.79			.04	2.50	1.70		.08	1.65		.35	2.50	1.40	.40	.60	1.50	16.12
Shoals [1]				.41	.04	.03	.75		.16					.32		.82	.98				2.25	1.75		.11	1.54		.36	2.13	1.14	.70	1.77	1.23	16.49
Vallonia [1]			.22	.02		.90			.25					.41		.81	.65			.20	2.77	1.41		2.00	.35		.20	2.32	.74	1.60	1.95		16.80
Vevay (Dam 39) [1]				.37	.06	.38	.57		.35					.63		.35	1.42	.05		T	.24	2.61		.22	1.51		.12	2.05	3.00	.40	.34	2.65	17.32
Vincennes			.31		T	2.58			.31				.05	1.46	T	1.25	.58			.35	4.02	.05		.46	.32		1.20	1.80	.50		.80		16.04
Washington			.89		.02	1.09			.20					.40		1.59	.45			.09	5.03	.18		.45	1.37		1.75	2.46	1.00		1.46		18.43
Williams [1]				.29	.05	.04	.93		.12					.61	T	.96	.80	T		T	2.85	1.71		.20	1.48		.31	2.01	1.02	.90	.68	1.24	16.20
OHIO																																	
Northern Division																																	
Ashland			.15	.05	.15	.10	.85		.10	T	T		.10	.02	.25	.35	.25	T	T	.03	2.00	.70	T	.01	.95		.02	1.00	.70	.30	.40	.40	8.88
Bangorville			.15	.20	.05	.12	.75		.12	T	T			.52	.10	.32	.25			.25	1.95	1.02		.08	1.30		.28	1.32	1.20	.30	.25	1.02	11.55
Canfield			.05		T	.40	.25		.14					.26		.32	.17		.03	.03	.83	1.03	T	.08	.55		.20	1.03	1.25	.20	.70	.78	8.30
Canton			.20	T	.43	.24	T		.06	T				.25	.02	.40	.02			.25	2.23	.73	03	.60	.48		.38	1.30	1.26	.05	1.32	.24	9.99
Kinsman [1]			.26		.22	.59		.06	.15	T			.05	.78	.19	.47				.70	1.09	.05	T	.76	.03		1.18	.78	.25		1.41		9.02
Mansfield			.33		.04	.28	1.16		.27	T				.58	.09	.33	.50			.04	2.03	.54	T	.23	.97		.10	1.25	1.02	.10	1.08	.24	11.18
Millport			.03	.02	.18	.38	.46		.28					.30	.02	.38	.28				.78	1.08		.18	.84		.38	1.02	1.42	.45	1.28	.76	10.52
Plymouth			.30	.05	.05	.20	.69		.07	.18	T			.55	.23	.44	.33		.01		1.71	.80	T	.01	.67		.09	1.05	.82	.13	.89	.33	9.60
Warren			.03	.25	.02	.38			.42	.03				.57	.38	.32	.30		T	.05	1.11	.80	.05	.10	.50		.05	.90	1.30	.24	.62	.63	9.05
Wooster (1)			.23	.18	.06	.09	.36		.11	.06	T			.33	.05	.37	.40			T	1.57	.85		.05	.98		.18	.95	1.25	.40	.63	.66	9.76
Youngstown [1]		T		.08		.32	.33		11	.03	T			.09	.32	.13	.44		T		.55	1.22	.02		.67		T	1.11	1.11	.42		1.44	8.39
Central Division																																	
Bellefontaine				.20	.04	.12	.62		.05	.04	T			.42	.11	.53	.50				2.32	.72		.04	1.12		.18	1.55	1.08	.15	1.00	.28	11.07
Cadiz			.02	.12		.03	.45		.01				T	.53		.31	.33			.02	(3)	1.53		.24	.73		.53	1.15	2.14	.45	.67	.06	9.32
Cambridge			T	.27		.53	.45		.27	.02				.43		.37	.47			.02	.81	1.07		.19	.81		.58	.93	1.45	.64	.80	.66	10.77
Columbus [2]			.35		.21	.50	.10		.09	T			T	.61	.01	.75	.09	T		T	2.10	.07		.66	.60		1.02	1.54	1.33	.02	1.65	T	11.70
Coshocton [1]				.43		.40	.51		.14	.02				.48	.31	.14	.43				.81	1.81			1.43	.04	.09	1.31	1.48	.68		2.15	12.66
Delaware [1]			.28		.04	.18	.83		.14	.01				.24	.02	.42	.30			.05	1.51	.98		.12	1.33		.35	1.72	1.51	.23	.99	.31	11.56
Demos			T	.20	.06	.07	.47		.47	.12				.51		.41	.64			T	.75	.91	T	.28	.87		.69	.57	1.84	.58	.69	.79	10.92
Dennison				.20	.08	.39	.42		.32	T				.48		.42	.15			T	.91	1.12		.33	.71		.47	.96	1.44	.46	1.30	.83	10.99
Greenville			.36		.09	.83	.09		.07	T				.52	.02	.53	.30			.50	(3)	3.20		1.00	.27		1.00	1.81	.42		.99		12.00
Kenton (near)			.25		.35	.10	.66		.05					.50		.50	.45			T	2.03	.67		.03	.74		.12	1.80	.80		.77	.20	9.72
Lakeview [1]				.31	.08		.71		.06					.21	.40	.50	.52				1.60	1.20			1.10			1.56	.76	.47		1.29	10.85
Larue [1]						.76	.67			.22				.06	.36	.41	.54				1.11	1.09			.85		T	1.47	.75	.39		.92	9.10
London (near)			.52			.05	.70		.30					.64	.35	1.10	.05			.15	2.05	.76		.20	.92		.65	.75	.90	.45	1.50		12.04
Marion			.22		.06	.30	.80		(3)	.25				.34	.15	.43	.37	.08		.05	2.02	1.35		.08	1.02		.14	1.30	1.01	.52	.72	.45	11.66
Marysville			.28	.04	.03	.24	1.02		.09	.09				.49		.39	.11			.27	1.77	.75		.10	1.17		.31	1.77	1.03	.38	1.02	.24	11.59
Millersburg			.33	.19	.01	.20	.56		.12	T				.28	.02	.35	.27			T	1.35	.87		.09	.68		.25	.62	1.09	.28	.88	.63	9.07
Mt. Vernon (near)			.49	.02	.21	.38	.23		.18	.22				.42		.82				T	2.23	.13		.16	1.19		.77	1.24	1.48	.29	1.41	.18	12.05
Newark			.24	.23	.02	.35	.76		.11					.54		.50	.18				1.53	.57		.14	1.03		.64	1.23	1.83	.38	1.44	.79	12.51
New Bremen			.15		.05	.24	.40		.02	T				.45	.01	.41	.37	.01		.05	1.39	.79		.06	.70		.11	1.29	.56	.04	.56	.19	7.85
New Carlisle [1]				.09		.48	.76	.09						.78	.89	.20	.13				.48	1.57			1.25			2.00	1.00	.50	.10	1.95	12.27
Newcomerstown [1]				.20	T	.18	.43		.20	.04				.22	.11	.14	.48	T			.14	1.89			1.02	T	.03	1.16	1.31	.65	.05	1.93	10.18
Ohio State University			.46		.04	.17	.73		.10	T				.63	.01	.60	.21			T	1.39	.78		.21	1.10		.42	1.57	1.49	.24	1.46	.24	11.85
Philo (1)				.23	.07	.22	.41		.29	.04				.27		.33	.71			.04	.67	1.04		.12	.81		.48	.69	1.76	.47	.78	.55	9.98
Philo (2)				.69	.03	.25	.53		.32					.33		.46	.68				.86	1.07		.18	.91		.60	.37	2.30	.70	.76	.71	11.75
Piqua [1]				.25	.09	.04	.68		.02	.06	T			.05	.37	.58	.59				2.27	1.20			.97		.04	1.73	.78	.42	.14	.98	11.26
Pleasant Hill [1]			T	.26	.08	.04	.84		.08					T	.35	.65	.36				1.88	1.27			.95		.03	1.84	.81	.47		1.10	11.01
Prospect [1]				.19	.05	.31	.80		.02	.15				.08	.22	.26	.36				1.40	1.21			.96			1.40	.78	.48		1.11	9.78
Sidney [1]				.33	.25		.69		.03	T	.01			.14	.32	.62	.28				2.06	1.29			.98		.12	2.00	.50	.38	.14	.97	11.11
Springfield (1)			.25	T	.08	.43	.66		.10	T				.52	.01	.61	.35	T		.01	1.97	.80		.05	1.22		.31	1.97	1.44	.25	1.47	.30	12.80
Tippecanoe City [1]				.32	.07	.04	.67		.03	.35	T			.24	.40	.51	.50				1.57	1.41		T	1.12			2.16	1.00	.58	.12	1.26	12.35
Urbana			.10		.11	.23	.57		.10	.26			T	.57	.03	.48	.42			.03	1.85	.79		.05	1.19		.22	1.96	2.16	.22	.61	1.22	13.16
Valley Crossing			.35	.03	.03	.22	.49		.15	T				.64	.02	.61	.20			T	1.11	.90		.26	1.01		.63	1.44	1.30	.27	1.61	.10	11.37
Versailles [1]				.42	.06	.18	.82		.08	.04				.07	.68	.52	.09				2.08	1.40			.92		.07	2.18	.75	.48		.98	11.82
Walhonding [1]				.10	T	.25	.05		.18					.17	.14	.20	.16				.65	1.64		.03	.80	.05	.07	1.17	1.46	.50		1.69	9.31
Zanesville [1]				.29	T	.09	.48		.24	.07	T			.25	.13	.08	.70	.10		T	.05	1.70		T	.96	.02	.03	1.25	1.50	.75	.05	1.65	10.39

[1] Precipitation for 24 hours ending in the morning.
[2] Precipitation for 24 hours ending at midnight.
[3] Included in the next following measurement.

TABLE 7.—*Daily amounts of precipitation (inches and hundredths) at selected stations in the Ohio River watershed, Dec. 25, 1936, to Jan. 25, 1937*—Continued

	December 1936							January 1937																									Total
	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
OHIO—continued																																	
Southern Division																																	
Athens [1]				0.32		0.10	0.32		0.28	0.06				0.52		0.05	0.84	0.30			0.10	1.78	T	0.03	1.27	0.05	0.15	0.81	1.61	0.34	0.11	1.43	10.47
Batavia (near)			0.29		0.08	.10	.75		.12					.49		.82	.62			0.01	2.28	.73		.22	1.40		.73	2.02	2.22	.53	2.15	.45	16.01
Beverly [1]				.16	.10	.12	.61		.42	.10				.47			.97	.28				1.90	T	.16	1.11		.10	.86	1.45	.40	.20	1.35	10.76
Caldwell (near)				.21	.05	T	.34		.41					.30		.48	.66			T	.66	.74		.19	.81		.74	.68	1.78	.70	.78	.76	10.29
Chillicothe [1]				.31	.05	.13	.75		.29	.09				.24		.16	1.07	.31			.09	2.20		.02	1.11	.02	.14	1.32	2.26	1.14	.20	2.15	14.05
Cincinnati, Abbe Observatory [2]			.37		.34	.98	T		.35				0.16	.16	0.02	.99	.10	T		.01	2.64	.02		1.13	.69		.89	2.65	1.17	T	2.54		15.21
Cincinnati, Faller Building [2]			.30		.28	.65	T		.42				.13	.13	T	1.05	.16	T		T	2.95	.09		.99	.73	T	.81	2.73	1.44	T	2.27	.04	15.17
Circleville [1]				.20			.40	0.20						.40		.14	1.43		T	T	.79	1.50			.18	1.79	.13	1.75	2.00	.75	1.90		13.56
Dam No. 28 [1]				.21	.05	T	.48		.85	.12				.59			.86	.37		.04	.03	1.22	T	.06	2.15	.35	.22	.45	.45	1.45	1.87	.83	12.65
Dayton (1) [2]			.26		.16	.62			.34	T			.02	.90	T	.95	.14			.29	2.42	.02		.95	.61		.91	2.03	1.01	T	1.72		13.35
Dayton (2) [1]				.26	.04	.11	.72		.06	.16	T			.32	.62	.43	.53				1.15	1.53		.10	1.38	.01	T	2.00	1.04	.66		1.65	12.77
Eaton [1]				.42		.02	.96			.09				.58	.42	.72	.55				2.04	1.31		T	1.38			2.37	.91	.94	T	1.18	13.89
Fernbank [1]				.25	.10	.48	.50		.19					.25	.05	.35	.95	.07		T	.95	2.10	.45	.06	1.73	.03	.15	2.07	2.04	.67	.42	2.15	16.01
Franklin [1]			T	.45	.05	.25	.77		.08	.15	T			.43	.52	.56	.63	T		T	1.36	1.86		.05	1.86	T	.05	2.10	1.34	.72	.04	1.89	15.16
Gallipolis (near)			T	.31	.12	.01	.55	.70	.01				.01	.44		.25	2.30			.02	.07	1.06		.48	1.06		.56	.42	1.28	.72	.80	.69	11.86
Germantown			.22		.16	.15	.62		.20	.10				.85	.02	.90	.09			.08	1.71	.84		.10	1.55		.41	1.70		(3)	1.60		11.30
Hamilton (1) [1]				.30	.08	.12	.59		.22	.04				.57	.28	.58	.70				1.15	1.74		.10	1.68	.02	.07	2.26	1.64	.85	.58	1.31	14.88
Hillsboro			.33	.06	.14	.16	.98		.13	.30				.45		.70	.80				2.03	.80		.25	1.25		.73	1.83	2.09	.83	1.50	.73	16.09
Jackson				.37	.10	.05	.82		.59					.48		.23	1.59	.02		.02	.68	.98		.43	1.03		.73	.81	1.90	.55	.95	.80	13.13
King's Mills [1]			.08	.46	.03	.02	.80		.23					.08	.56	.46	.79	.03	T		.64	1.83		.16	1.76		.08	1.97	1.88	.62	.83	1.07	14.38
Lancaster			.12	.41	.04	.23	.71	.01	.21	.26				.52	T	.51	.58	T		.01	.80	1.20	.02	.20	.87		.66	1.20	2.00	.49	1.40	1.30	13.75
Lock No. 23 [1]				.33		T	.45		.65	.72				.59			1.50	.60		.02	.05	1.27	T	T	1.55	.29	.25	.45	.56	1.40	.62	1.04	12.34
Lowell [1]				.30		.05	.60		.42					.72	.11	.02	1.02	.32			.09	1.92		.04	1.30	.03	.30	.80	1.40	.50	.70	1.00	11.64
McArthur			T	.30	.11	.12	.71		.41	.02				.44		.30	1.05	T		.02	1.06	.82		.30	.96		.76	.88	1.80	.65	1.21	.70	12.62
McConnelsville			.13	.12	.03	.06	.50		.40	T				.35		.49	.63			T	.86	.90		.21	.90		.95	.90	1.73	.50	.86	1.00	11.52
Marietta (Phillips)				.23	.03	.04	.59		.49	.11				.40	.01	.15	1.43	.01		.01	.71	.92		.33	.96	.03	.89	.46	1.55	.61	.76	.79	11.51
Miamisburg [1]				.32	.08	.21	.78		.15	.23				.53	.49	.70	.75			.03	1.30	1.59		.10	1.78		.12	1.92	1.35	.92		1.91	15.26
Middletown [1]				.20	.08	.15	.72		.15					.72		.45	.50	.05			1.50	1.40		.15	1.90		.10	2.00	1.40	.60	.15	1.78	14.00
Mount Healthy (near)			.55	.08	.52	.28	.37		.28					.68	.17	.50	.37				1.17	.60		.32	.65		.70	1.80	.52	.25	1.75	.40	11.96
Peebles (near)			.20	.20	.30	.14	1.01							.68		.67	1.00			T	.80	1.10		.41	.96		.65	1.28	2.22	1.00	.38	.88	13.88
Portsmouth (2) [1]				.37	.04	.18	.75		.66	.02				.48		.04	2.38	.45		.01	.01	1.43	T	.10	1.35	.02	.26	.64	1.26	1.73	1.07	.30	13.55
Washington C. H. [1]				.33	.04	.18	.61		.20	.02				.39	.02	.18	.88	.04			.37	2.00		.10	1.28	.01	.04	1.61	2.09	.82	.20	2.14	13.55
Waverly			.11	.28	.15	.25	.85		.46					.48		.54	1.30			.01	1.40	1.10		.35	1.12	.90	.74	1.30	2.10		.90	.71	15.05
West Manchester [1]			.32			.12	.78			.22				.35	.30	.58	.70				2.45	1.66			1.06		T	2.06	.81	.46	.18	1.15	13.20
Wilmington			.54		.03	.11	.75		.34					.64	.02	.78	.56	T		.12	1.53	.56		.18	1.79		.70	1.68	1.84	.60	1.30	.76	14.83
Xenia			.39		.07		.85		.06	T				.73	.05	.83	.28			T	1.87	.82		.11	1.62		.36	1.82	1.47	.27	1.28		12.88
WESTERN PENNSYLVANIA																																	
Beaver Falls [1]				.01		.26	.26		.19	.15	T			.15	.14	T	.53	T		T	.01	1.62	T	T	.71	T	T	1.12	1.13	.42		1.50	8.20
Bradford			T	.17	T	.35	.36		.14	T	T			.40	.34	.15	.16			T	1.38	.65	T	.08	.74		T	1.05	.72	.15	.68	.78	8.30
Brookville [1]				.08		.22	.60		.06	.40				.34	.53		.41				.38	1.20	.01	T	1.60	.03		1.58		.32		1.71	9.47
Butler			.05			.26	.50		.35	T				.44		.22	.20					1.31	T	T	1.01			1.47		.70	(3)	1.30	7.81
Chambersville			T	.01	.03	.18	.33		.56	.02				.75	T	.15	.44	T		T	.51	.67	T	.22	.94		.24	.82	1.01	.36	.59	.54	8.37
Clairton [2]			.01		.02	.03	.12		.55					.39		.06	.67			T	.17	.76		.76	.41		.66	.75	.77	.10	.71	.17	7.11
Claysville				.06	.04	.01	.24		.48	.06				.46		.15	.76				.61	1.05	T	.34	.88		.52	.50	1.53	.45	.59	.65	9.38
Confluence [1]				.05			.32		.34	.70				.70	.20		1.00	.60				.40	.08		1.20	.11	.18	1.05	.60	.47	.10	.96	9.06
Corry			.17	.21	.01	.28	.67							.56	.51	.28					1.59	.60			.60	.01	.1	.71	(3)	(3)	1.60	.71	8.70
Derry			T		T				.99					.58		.15	.92	T			.20	.55		.20	1.16		.55	.60	.79	.37	.40	.65	8.11
Donora [1]					T	.11	.13		.70					.62		T	.72	.07			T	1.00		.22	.94		.22	.77	.98	.15	.36	.45	7.44
Ebensburg				.01		T	.27		.45	.08				.46	.27		.45	.71			T	.32		T	1.01	T	.03	1.06	.75	.22		.94	7.03
Elk Lick							1.50	1.30									2.00					.25					.60	.20	.11	.07	1.80	1.40	9.23
Franklin [1]						.52	.65		.05	.29	.05			.20	.97	.07	.42				.37	1.38	.03		1.02			1.95	.94	.28		2.12	11.31
Greensboro [1]				.10			.34	.02	.38	.19				.52	.02		.97	.47			T	.71	T		1.06	.23	.13	.51	.97	.70	.01	.96	8.29
Greensburg			T		.05	.11	.18		.70		T			.71	T	.12	.75	T			.30	.59	T	.27	1.03		.80	.45	.94	.34	.48	.58	8.40
Greenville			T	.12	T	.36	.42		.13	T	.02			.70	.50	.32	.22			.02	.76	.86	.04	.12	.70		.10	1.12	.97	.43	.65	.79	9.35
Grove City			T	.10	.05	.34	.53		.17		T			.55	.12	.16					.17	1.00	T	.07	.69		.20	.94	.81	.41	.36	1.79	8.46
Herrs Island Dam [1]				.02		.04	.24		.29	.32	T			.46	.14	T	.40	.07	T		.08	1.13	T		.93	.07		1.15	1.25	.53	T	1.27	8.39
Irwin				.04	.05	.20	.18		.65	.02				.52	.11	.75					.31	.60	T	.26	1.05	T	.73	.25	1.10	.30	.48	.55	8.24
Johnstown			.01	.02		T	.29		.64		T			1.30		.30	1.09			T	.03	.35		.58	.55		1.52	.65	.96	.01	.75	.37	9.42
Kane (near) [4]			.06	.19		.33	.55		.32	.11	.03			.51	.38	.15	.06				.84	.74	.02	.12	.84		.04	1.34	.70	.05	.87	.42	8.67
Kregar [1]			T		.05	.28	.03	.32	.34				.74	.10		.81	.55	T		T	.36	T		1.20	.15	.08	.95	.85	.58		1.02		8.41
Lake Lynn [1]				.03			.10		.24	.14	.01			.40	.04		1.08	.45			.01	.61	.03		1.40	.20	.16	.35	.58	.67		1.10	7.60
Linesville [1]				.40		.20	.12				.14				.94	.28					1.34	.02			.77			1.04	.05	.17	1.47	.19	7.13
Lock No. 2 [1]				.04		.05	.27		.26	.32				.29	.17	T	.43	.02			.01	1.18			.73	.08	T	1.13	1.15	.45	T	1.06	7.64
Lock No. 4 [1]				.03		.06	.31		.38	.29				.53	.06		.52	.40			.02	.98			1.03	.15	.08	.89	.98	.38		.82	7.91
Lock No. 5 [1] [5]				.05		.15	.41		.18	.37				.37	.24		.43	.01	T		.07	1.16	T	T	.93	.09	T	1.20	1.11	.49		1.24	8.50
Lycippus					.06	T	.31		1.21	.08				.90		.30	1.08		.02		.25	.60		.35	1.20		1.10	.38	.92	.33	.60	.80	10.49
McKeesport [1]				T		T	.17		.33	.18				.39	.02		.45	.16			T	.96			.93	.01	.03	.80	1.05	.42	.14	.81	6.85
Meadville			.08	.12	T	.25	.70		.07	.02	T			.53	.54	.26	.15				1.10	.77	.03	.11	.73		.05	1.52	.65	.22	.70	.87	9.47
Midland				.06	.10	.29	.39		.42	.06	T			.35		.38	.21				.55	1.19	T	.20	.70	.06	.24	1.10	1.37	.67	.84	.69	9.87
Mosgrove [1]				.03		.18	.53		.05	.52	T	T		.25	.51	T	.43	.02			.11	1.09	.04		1.00	.08	T	1.46	.62	.53		1.69	9.14
Mount Lebanon			.02		T	.03	.30		.50				.01	.60		.21	.46			.01	.45	.80	T	.50	.48		.41	.88	1.30	.15	.62	.46	8.19
Natrona [1]				.04		.21	.35		.25	32				.40	.19		.43	.02	T		.05	1.02	.01	.02	.86	.08	T	1.19	1.02	.46		1.22	8.14
New Castle [1]				.07		.31	.37		.17	.03				.08	.32	.16	.50		T		.33	1.26	.02		.51	.02	T	1.23	.85	.43	.02	1.04	7.72
Newell	1.00	.20				.20		1.00	.40				.80				.80				.80			1.20	.05	.30	.80	.80			1.30		9.65
Parkers Landing [1]				.12		.22	.79	T	T	.38	T			.14	.48	.05	.44	T			.18	1.35	T	T	1.05	T	T	1.44	1.02	.20		1.80	9.66
Pennline [1] [6]				.40		.15	.50			.10	.02			.07	.88	.34	.12				1.20	1.04	.04		.75	.02		1.07	.42	.19		1.40	8.71
Pittsburgh [2]			.03	T	T	.02	.21		.38	T	T		.01	.50		17	.44	T	T	.03	.42	.56	T	.57	.47		.32	.84	.92	.15	.77	.22	7.03
Punxsutawney [1]				.02		.26	.62		.02	.45				.22	.35		.39	.04			.04	1.00			.87	.05		1.13	.92	.35		1.27	8.00
Ridgway				.03		.21	.79		T	.53	T			.13	.41	.05	.05	.58			.39	1.07	.01	T	.80	T		1.20	1.07	.25		1.52	9.09
Saltsburg [1]				T		.04	.46		.25	.34	T			.66	.12		.50	.20			.06	1.04	T	T	1.23	.08	.07	1.07	.99	.44	T	1.16	8.71
Sharon [1]				.14		.37	.43		.08	.09	T	T		.13	.74	.14	.38				.53	1.02	.03		.73			1.15	1.01	.25		1.45	8.67
Smethport [1]		.02		T	T	.65				.08	T				.25		T	T		.02	.64	1.08	T		.88	.05	.05	.90	.95	.15	.10	1.90	7.72
Somerset				.03		.02	.53		.70					.93		.02	1.48	01			.02	.31	T	.33	.84		1.11	.19	.81	.27	.48	.46	8.54
Springdale [1] [7]				.05		.09	.30		.25	.37				.56	.18		.43	.05			.06	1.00	T		.98	.10	T	1.13	1.15	.47		1.35	8.52
Uniontown			T	.16			.37		.37	.01				.59		.17	1.28	.04			.15	.61		.27	1.02		.38	.26	1.20	.35	.55	.63	8.41
Unity Reservoir [8]			T		.05	.05	.24		.55					.77		.12	.82	.04			.26	.56		.53	.79		.76	.43	.92	.30	.47	.60	8.26
Vandergrift [2]			.03		.02	.08			.16					.48		.45	.45			.14	.30	.21		.45	.21		.39	.70	.65		.42	.18	5.32
Warren				.08		.05	.22		.23		.06			.74		.04	.26			.20	1.00	.48	.03	.30	.52		.10	1.08	.30	.24	1.02	.80	7.75
Waynesburg				.15		.06	.24		.59					.63		.06	1.04				.42	.74		.32	.86		.70	.26	1.24	.20	.70	.40	8.61
Westford [1]			.33		.18	.70			.22	[illegible]			.04	.80	.28	.26				.85	1.00	.06		.80	.04		1.10	.40	.42	.35	1.50		9.33
West Newton					T	.02	.23		.27	.23				.51	.04		.44	.23				.83			1.08	.08	.07	.71	.80	.37		.80	6.71
Erie [2]		T	.17		.05	.04	.29		.09	.03	.01			.57	.09	.21	.12			.27	1.29	.33	T	.18	.21	T	.03	.73	.59	T	1.14	.02	6.46

[1] Precipitation for 24 hours ending in the morning.
[2] Precipitation for 24 hours ending at midnight.
[3] Included in the next following measurement.
[4] Post office address, Wilcox.
[5] Post office address, Schenley.
[6] Post office address, Linesville.
[7] Post office address, Barking.
[8] Post office address, Greensburg.

TABLE 7.—*Daily amounts of precipitation (inches and hundredths) at selected stations in the Ohio River watershed, Dec. 25, 1936, to Jan. 25, 1937*—Continued

Station	December 1936							January 1937																									Total
	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
WEST VIRGINIA																																	
Northeastern Panhandle Division																																	
Bayard	----	----	----	----	0.13	0.04	0.23	----	----	0.76	----	----	0.75	----	0.02	0.95	0.13	----	----	----	0.40	----	----	0.67	0.08	0.50	0.75	0.36	----	0.60	0.85	0.38	7.60
Circleville [1]	----	----	----	T	.13	T	.30	T	.34	.89	.14	----	----	.64	----	----	.07	.17	----	T	T	.58	.18	----	.77	.16	.34	.87	.16	.37	.10	.38	6.59
Northern Division																																	
Aberdeen	----	----	----	0.07	----	T	0.61	----	0.78	----	----	----	----	0.48	----	0.02	1.16	0.01	----	T	T	0.97	----	0.49	0.90	0.13	0.55	0.20	0.75	0.98	0.80	0.63	9.53
Alma (near)	----	----	----	----	0.01	----	.39	----	.56	----	----	----	----	.45	----	.13	1.49	----	----	----	0.05	.85	----	.45	.91	----	.62	.20	1.00	.52	.67	.62	8.92
Alpena	----	----	----	.17	----	0.14	.40	----	1.02	----	----	----	----	1.08	----	----	.50	.03	----	----	----	.78	0.57	.45	.06	.04	1.51	.20	.30	.50	.21	.53	8.49
Benson	----	----	----	.15	----	----	.64	----	.67	----	----	----	----	.68	----	.37	1.48	----	----	----	.08	.68	----	.42	1.27	.06	.66	.15	.68	1.20	.65	.66	10.50
Bens Run	----	----	----	.24	.03	.02	.55	----	.46	----	----	----	----	.60	----	.38	1.14	----	----	T	.37	.99	----	.45	1.01	----	.86	.30	1.53	.40	.53	.65	10.51
Brownsville	----	----	----	.11	----	----	.60	----	.83	----	----	----	----	.63	----	----	.83	----	----	----	----	.88	----	.49	.84	.14	.61	.22	.64	1.01	1.14	.65	9.62
Buckhannon	----	----	----	.18	----	----	.61	----	.78	----	----	----	----	.60	----	T	.84	----	----	0.08	----	1.00	----	.45	.78	.06	.65	.23	.68	.84	.90	.62	9.30
Cairo	----	----	----	.19	----	.08	.75	----	.74	----	----	----	----	.62	----	----	1.87	----	----	----	----	1.02	----	----	1.90	----	.57	.30	.79	1.15	.73	.76	11.47
Clarksburg [1]	----	----	----	.07	.02	.04	.56	----	.44	0.20	----	----	----	.66	----	----	1.11	.52	----	----	----	.58	----	.01	1.42	.20	.29	.43	.24	1.18	.50	.72	9.19
Crawford	----	----	----	.06	----	----	.56	----	.87	----	----	----	----	.64	----	----	.77	.06	----	----	----	.91	----	.41	.64	.23	.55	.18	.75	.72	.50	.77	8.62
Creston [1]	----	----	----	.02	----	T	.62	----	.70	.01	----	----	----	.81	T	----	1.10	.32	T	T	T	1.03	----	.03	.68	.33	.45	.21	.40	1.79	.61	1.20	10.31
Dam 10, Mon. R. [1]	----	----	----	.04	T	----	.43	.05	.22	.20	----	----	----	.53	0.07	----	1.29	.49	----	T	.02	.63	.01	----	1.54	.24	.15	.44	.65	.74	.06	.94	8.74
Dam 13, O. R. [1]	----	----	----	----	.02	.04	.32	----	.42	.18	----	----	----	.44	.05	----	1.05	.29	----	----	.06	1.70	----	----	1.18	.06	.13	.85	1.58	1.18	.02	1.48	11.05
Dam 15, Mon. R. [1]	----	----	----	.06	T	.03	.42	.07	.23	.28	----	----	----	.57	.05	----	1.30	.42	----	----	.03	.64	.03	----	1.52	.26	.20	.53	.53	.85	.08	.98	9.08
Davis [1]	----	----	----	----	----	T	----	----	.21	----	----	----	----	.49	----	.06	.39	----	----	----	----	.31	----	1.00	1.10	.19	.12	1.16	.96	1.29	.84	.28	8.40
Elizabeth (D'm 3 LK)	----	----	.35	----	T	.52	----	1.20	.42	----	----	----	.54	----	----	1.50	.32	----	T	T	1.10	----	----	1.70	.10	.24	.52	.50	1.10	.50	.92	----	11.53
Elkins [2]	----	----	.07	T	T	.01	.40	----	.77	.01	----	----	.22	.44	----	.04	.51	----	----	T	----	.83	----	.50	.41	.06	1.00	.14	.72	.21	.16	.45	6.95
Fairmont [1]	----	----	.33	----	.03	.48	.09	.35	.17	----	----	----	----	.05	----	1.20	.37	----	----	.02	.64	----	.05	1.53	.18	.20	.52	.54	.68	.38	.83	----	8.64
Glenville [1]	----	----	----	.35	----	.03	.59	----	.77	.16	----	----	----	.64	----	----	.78	.54	----	----	.04	.67	----	.21	1.05	.33	.38	.62	.31	1.54	1.42	.75	11.18
Grafton	----	----	----	----	.03	----	.68	----	.70	----	----	----	----	.70	----	.12	1.50	.01	T	----	----	----	----	1.84	.46	.04	.74	.19	.88	.52	.91	.53	9.85
Hackers Creek	----	----	.02	----	----	.72	----	.69	----	----	----	----	----	.57	----	.25	1.19	----	----	----	----	.83	----	.50	1.08	----	.66	.16	.64	1.18	.50	.33	9.32
Hastings	----	----	----	.22	.04	.08	.54	----	.50	----	----	----	----	.63	----	.09	1.69	----	----	T	.08	1.14	----	.41	1.10	----	.72	.27	1.16	.65	.63	.64	10.59
Horner	----	----	----	.12	----	----	.60	----	.40	.80	----	0.15	----	.50	----	----	----	.85	----	----	----	----	----	1.00	1.25	.15	----	.20	.90	1.50	----	----	8.42
Ireland	----	----	----	.20	----	----	.18	----	.95	----	----	----	----	.51	----	.63	----	----	----	----	----	1.07	----	.51	.31	.12	.21	.51	.72	.60	.32	.74	7.58
Jackson's Mill	----	----	.09	----	----	.56	----	----	.83	----	----	----	----	.56	.10	1.28	----	----	----	----	.04	.84	----	.64	.84	.10	.64	.19	1.24	.46	1.42	.60	10.43
Jane Lew	----	----	----	----	----	.10	.68	----	.80	----	----	----	----	.48	----	----	1.30	----	----	----	----	.98	----	.55	.88	.12	.62	.30	.80	1.04	1.24	.62	10.51
Lost Creek	----	----	----	.04	----	T	.55	----	.74	----	----	----	----	.55	----	.10	1.56	T	T	T	.02	.77	----	.52	1.08	.10	.65	.21	.76	.84	.98	.56	10.03
Mannington	----	----	.01	.11	.02	----	.49	----	.65	.02	----	----	----	.58	----	.07	1.64	T	----	T	.06	.80	----	.38	1.05	----	.61	.17	.81	.58	.74	.53	9.32
Morgantown	----	----	T	----	----	----	----	----	----	----	----	----	----	.45	----	.13	1.97	----	----	----	----	.73	----	.40	1.72	----	.50	.15	1.30	.50	.57	.50	8.92
New Cumberland	----	----	.02	.07	.10	.32	.45	----	.45	T	----	----	----	.32	.01	.25	.25	.06	----	----	.60	.95	----	.32	.74	----	.31	1.06	1.39	.32	.87	.61	9.47
New Martinsville	----	----	----	.42	----	.10	.50	----	.45	----	----	----	----	.62	----	.10	1.30	----	----	----	.38	1.10	.42	----	1.10	----	.80	.35	1.45	.35	.25	.45	10.14
Parkersburg [2]	----	----	.25	T	.04	.03	.54	----	.54	.02	----	----	.11	.26	----	.49	.96	T	----	.08	.53	.58	----	.63	.57	----	.70	.79	.98	.25	1.05	.16	9.56
Parsons	----	----	T	----	----	.70	T	----	.47	----	0.35	----	.05	----	----	(3)	.18	----	----	----	----	----	----	----	(3)	(3)	2.35	----	1.15	.25	(3)	.50	6.00
Parsons No. 2	----	----	----	.04	----	.01	.40	----	.75	.02	----	----	----	.60	----	T	.88	.01	----	T	----	.81	.01	.41	.45	.03	.98	.14	.76	.51	.38	.45	7.64
Philippi [1]	----	----	----	.04	----	----	.56	----	.64	----	----	----	----	.66	----	----	.65	.12	----	----	----	1.01	----	.23	1.08	.11	.34	.07	.32	1.52	1.01	.60	8.96
Pickens	----	----	----	----	----	----	.85	----	1.05	.10	----	----	.92	----	----	----	1.56	----	----	.06	----	1.25	----	.81	.33	.35	1.03	.17	.39	.50	.35	.30	10.02
Roanoke	----	----	----	.06	----	.46	----	----	.89	----	----	----	----	.56	----	----	.81	.05	----	T	----	.95	----	.56	.74	.16	.65	.26	.80	.74	.45	.50	8.64
Rockford	----	----	----	.09	----	T	.68	----	.73	----	----	----	.45	----	----	.10	1.68	.02	----	T	----	.85	----	.55	.80	.11	.57	.19	1.34	.52	.92	.65	10.25
Saint Marys [1]	----	----	----	.30	T	.05	.62	----	.43	.08	----	----	----	.45	.04	----	1.37	.35	----	----	.05	1.20	----	.05	1.38	.05	.17	.83	1.22	.88	.30	1.03	10.85
Terra Alta	----	----	----	----	T	----	.80	----	T	----	.10	----	T	.90	----	T	T	1.90	----	----	T	.40	----	----	T	1.90	T	1.20	.70	1.20	----	1.50	10.60
Thomas [1]	----	----	----	.08	----	----	.30	.12	.62	.48	----	----	----	.29	----	----	.45	.60	----	----	T	.70	.20	.10	1.00	.18	.45	.83	.38	.97	.15	.78	8.68
Valley Chapel	----	----	----	.11	----	----	.71	----	.81	----	----	----	----	.56	----	.05	1.49	.01	----	----	----	.98	----	.50	1.12	.11	.72	.22	.95	.72	.94	.65	10.65
Vandalia	----	----	----	----	----	----	.54	----	----	----	----	----	----	.66	----	----	.83	----	----	----	----	1.04	----	.55	.64	.11	.65	.22	.86	.70	.62	.69	8.11
Wellsburg	----	----	----	.10	T	.15	.23	----	.46	.10	----	----	----	.48	----	.19	.49	----	----	T	.53	.95	----	.28	.45	----	.50	.83	1.53	.50	.63	.66	9.06
West Milford	----	----	----	.10	.12	.70	----	----	.70	----	----	----	.60	----	----	.25	1.50	----	----	----	.10	.80	----	1.70	.10	----	.80	.60	1.65	.90	----	----	10.62
Weston [1]	----	----	----	.12	----	.05	.48	----	.62	.18	----	----	----	.58	----	----	.52	.56	----	----	.02	.81	----	.06	1.28	.26	.32	.58	.36	1.61	1.18	.75	10.34
Wheeling (Dam 12) [1]	----	----	----	.10	T	.06	.35	----	.44	.23	----	----	----	.46	.10	----	.68	.18	----	----	.04	1.45	T	----	1.05	.04	.10	.93	1.51	.78	T	1.40	9.90
Woodlands [1]	----	----	----	.33	.01	----	.45	----	.25	.35	----	----	----	.51	.04	----	.70	.40	----	----	.05	1.50	----	T	1.14	.17	.06	.80	1.25	.70	T	1.30	10.01
Southern Division																																	
Arbovale [1]	----	----	----	.05	.18	.35	.05	----	1.05	.04	----	----	----	.87	----	----	.08	----	----	.02	----	.50	----	.87	.24	----	1.52	.08	.01	.20	----	.48	6.59
Bancroft	----	----	----	.30	.02	----	.50	----	.72	----	----	----	----	.65	----	----	.33	.67	----	----	.01	.94	----	----	1.32	.64	.34	.61	.32	1.24	.76	.69	10.06
Beckley	----	----	----	T	.16	.06	.48	----	1.25	.08	----	----	.05	.30	----	----	.16	.12	----	.16	----	.95	.06	.83	.58	.06	1.34	.17	.14	.24	.04	.86	8.09
Bluefield	----	----	----	.10	.12	----	.37	.02	.91	----	.11	----	.09	.11	----	----	----	.04	.29	.35	----	.68	----	----	1.33	.12	.80	.19	.10	.25	----	.99	6.97
Camden-on-Gauley [1]	----	----	----	.11	.02	.01	.28	.05	.65	.25	----	----	----	.79	.02	----	.09	.50	.10	.02	----	.88	.10	.12	.82	.20	.83	.66	.15	.52	.05	.80	8.02
Charleston	----	----	.28	----	T	.65	----	----	.73	----	----	----	.06	.51	----	----	.73	.03	----	----	.92	----	----	----	1.62	.45	.47	.36	1.24	----	.92	----	8.97
Clay [1]	----	----	----	.19	T	.05	.59	.10	.72	.07	----	----	----	.61	----	----	.22	.40	.05	T	----	.92	.07	.22	.52	.25	.39	.42	.30	.84	.06	.88	7.87
Dam 6 G. K. [1]	----	----	----	.27	----	----	.38	.08	.68	.22	----	----	----	.52	----	----	.13	.55	.02	----	----	.74	.06	----	.94	.90	.29	.56	.50	1.10	.23	.89	9.06
Dam 19 O. R. [1]	----	----	----	.30	T	.03	.60	----	.50	.13	----	----	----	.40	----	----	1.42	.29	T	T	.07	1.17	.02	.03	1.16	.08	.21	.69	1.40	.55	.26	1.16	10.47
Dam 20 O. R. [1]	----	----	----	.28	.02	.06	.55	----	.60	.06	----	----	----	.42	----	----	1.42	.28	.02	.01	.06	1.10	----	.02	1.10	.14	.15	.50	.80	1.01	.20	----	8.80
Dam 25 O. R. [1]	----	----	----	.38	T	.14	.59	----	.64	.12	----	----	----	.48	----	----	1.93	.51	----	----	.05	1.12	.03	----	1.32	.26	.22	.54	.75	1.60	.23	1.25	12.16
Dam 26 O. R. [1]	----	----	----	.19	.04	.03	.34	----	.70	.12	----	----	----	.77	----	----	1.20	.45	----	.02	.04	1.18	----	.05	2.10	.27	.29	.40	.66	.95	.57	----	10.37
Gary [1]	----	----	----	----	----	----	.37	.05	.76	.22	----	----	----	.39	----	----	----	.08	.15	.21	----	.69	.02	.54	.35	.50	.52	.21	.10	.21	.16	.72	6.25
Hinton [1]	----	----	----	T	T	.11	.38	.05	1.27	.42	----	----	----	.41	T	----	----	.04	.07	.10	----	.37	.15	.20	.92	.24	.80	.58	.12	.08	.39	.44	7.14
Huntington	----	----	.09	.13	.03	----	.43	----	.96	----	----	----	T	.58	----	.11	1.15	T	T	.08	.11	.96	----	.72	1.55	.13	.65	.40	1.22	.69	1.76	.71	12.46
Kanawha Falls [1]	----	----	----	----	----	----	.33	----	.50	.18	----	----	----	1.24	----	----	.01	.42	.29	----	----	.45	.04	----	.60	.60	.36	.01	.30	.40	.08	.80	6.61
Kayford [1]	----	----	----	.19	----	----	.51	.05	.79	.17	----	----	----	.42	----	----	.07	.31	.10	.01	----	.87	.07	.32	.32	.41	.50	.23	.21	.60	.05	1.09	7.29
Lewisburg	----	----	----	----	.19	----	.39	----	1.59	----	----	----	.07	.42	----	----	.07	.01	----	.29	----	.55	----	.92	.17	.05	1.43	.04	.03	.28	.04	.43	6.97
Logan [1]	----	----	----	.30	----	----	.52	.04	.94	.05	----	----	----	.40	----	T	.09	.36	.11	T	----	1.21	.03	.20	.73	.50	.52	.35	.20	.71	.03	1.05	8.34
London	----	----	----	.16	----	----	.33	.17	.58	.22	----	----	----	.49	.02	----	.01	.50	.09	----	----	.70	.28	----	.53	.49	.33	.36	.26	.65	.16	.90	7.23
Madison	----	----	.37	----	.01	.40	----	.80	----	----	----	----	.45	----	----	----	----	.75	----	----	.97	----	.41	.48	.27	.48	.53	.23	.84	----	.92	----	8.09
Point Pleasant [1]	----	----	----	.36	.08	.10	.50	----	.68	.10	----	----	----	.59	----	T	2.00	.57	----	.04	----	1.22	.04	.05	1.88	.08	.35	.46	.68	1.60	.25	1.00	12.72
Rainelle	----	----	----	.08	.05	T	.38	.01	1.25	.08	----	----	.02	.54	.01	T	.09	.02	.12	.06	----	.87	.04	.96	.44	.03	1.30	.10	.24	.29	.01	.83	7.82
Ravenswood (Dam 22)	----	----	----	.30	T	.05	.55	----	.56	.12	----	----	----	.60	T	----	1.65	.55	----	----	.03	1.30	----	----	1.75	.32	.24	.46	.65	1.42	.35	1.40	12.30
Richwood	----	----	----	.09	.02	----	.17	----	.50	.05	----	----	----	.55	----	----	.17	.03	.13	----	----	.94	.03	.50	.38	----	.95	.07	.09	.47	----	.96	6.10
Robertsburg [1]	----	----	----	.26	.01	.02	.35	----	.75	.06	----	----	----	.70	----	----	.87	.42	T	.03	T	1.27	T	.06	1.84	.22	.36	.45	.32	1.65	1.57	.74	11.95
Ryan	----	----	----	.26	.02	----	.60	----	.75	----	----	----	----	.63	----	.03	1.00	.02	----	.01	----	.92	----	.59	1.15	.25	.83	.41	.78	.80	.60	.70	10.35
Sharples [1]	----	----	----	----	----	----	1.02	----	.98	----	----	----	----	.47	----	----	----	----	----	----	----	1.68	----	.13	.71	.43	.63	.16	.22	.37	T	1.11	7.91
Spencer	----	----	----	.46	T	----	.54	----	.62	.09	----	----	----	.57	T	----	.82	.50	----	.02	----	.91	T	.09	1.30	.34	.44	.59	.29	1.47	1.29	.84	11.18
Summersville [1]	----	----	----	.10	----	----	.45	----	----	.79	----	.68	----	----	----	----	.48	----	----	.14	----	----	.94	.14	.76	.21	1.11	.22	.25	.71	.07	.96	8.01
Sutton	----	----	----	.25	----	----	.50	----	.95	----	----	----	----	.65	----	----	.65	.20	----	----	----	1.10	----	.45	.50	.10	.75	.20	.40	.85	.15	.80	8.50
Thornwood [1]	----	----	----	----	.24	.26	T	.31	----	----	----	.98	----	.23	----	----	.15	----	----	----	----	----	----	.22	.53	.98	1.00	.12	.47	.22	.14	----	5.85
Union	----	----	----	----	.13	.03	.23	----	1.42	----	.10	----	----	.18	----	----	----	.08	.10	.26	----	.40	----	----	1.10	.15	1.40	.08	----	.20	----	.65	6.51
Wayne [1]	----	----	----	.37	.02	----	.42	----	1.02	.06	----	----	----	.53	----	----	.49	.42	----	.03	----	1.24	----	.17	2.03	.40	.52	.58	.47	1.37	.70	.88	11.72
White Sulphur Springs [1]	----	----	----	----	----	----	----	1.10	.40	----	----	.40	----	----	----	----	.15	----	.35	----	.75	.10	.20	.80	.25	1.20	.50	.10	.05	.40	.45	----	7.30
Williamson [1]	----	----	----	.40	.01	----	.45	.03	1.14	.08	----	----	----	.25	----	----	T	.19	.18	----	----	1.30	.04	.23	.70	.51	.68	.21	.27	.71	.04	1.08	8.50

[1] Precipitation for 24 hours ending in the morning.
[2] Precipitation for 24 hours ending at midnight.
[3] Included in the next following measurement.

TABLE 7.—*Daily amounts of precipitation (inches and hundredths) at selected stations in the Ohio River watershed, Dec. 25, 1936, to Jan. 25, 1937*—Continued

	December 1936							January 1937																									Total
	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
SOUTHWESTERN VIRGINIA																																	
Burkes Garden			T	0.10	0.10		0.42		1.10	0.10			0.17						0.37	0.20		0.60		0.80	0.40	0.20	0.20	0.20		0.23		0.77	5.96
Clinchport [1]				.28	.06	0.05	.60		.60	1.28				0.12				0.05	.46	.58		1.17		.50	1.00	.85	.43	.07	0.12	.23		1.48	9.93
Dante				.45	.06		.65		1.40	.25			.02	.08				.14	.48	.32		1.15		.74	1.25		.51	.34	.12	.44		1.05	9.45
Emory				1.50				T	1.02	.42		0.02	.18	.05			T	.07	.62	.51		.71	0.02	.71	.54	.28	.98	.33		.16	0.04	.88	9.04
Floyd				.10	.17	.05	.60	T	1.70			.19	.23				0.12	T	.12	.30	0.03	.46		.94	.16	1.50	.77	.18	T	.80	.11	.13	8.66
Glen Lyn [1]				T	T	.10	.24	T	.68	.16			T	.19				T	.10	.37		.30	.06	.36	.56	.25	1.06	.09	.09	.06	.34	.58	5.59
Ivanhoe [1]					.76	.48	.47	0.08	.77	.64			.31	.17					.05	.63					.68	.47	.45	.17			.28	.08	6.49
Jewell Ridge [1]				.15	.01		.48	.07	.86	.15				.19				.10	.20	.38		.97	.03	.63	.59	.46	.51	.19	.06	.19	.18	.82	7.22
Lexington			0.03	.02	.30	.12			1.65	.31				.23				.14	.42		.18	.09	.43	.44	.61	.37	1.22	.10		.23	.07	.08	7.04
Mendota [1]				.20	.06	.05	.54		.95	.80			.11		0.06			.03	.36	.78		.96		.41	.83	.66	.51		.15	.18	.09	1.11	8.84
Mountain Lake				.06	.35	.10	.71		1.08	.27				.26		T			.11	.52	.04	.68		.92	.28	.51	.85	.33		.14	.18	.47	7.86
Pennington Gap [1]				.61	.18	.12	.85		1.80	.87				.16				.13	.38	.61	.02	1.11		1.06	1.19	.31	.52	.21	.40	.45	.18	1.81	12.97
Radford [1]						.40	.25	.04	1.03	.51			.07	.08				.02	.02	.83		.33	.10	.45	.36	.70	1.20	.04	.06	T	.09	.14	6.72
Rose Hill [1]				.54	.04		1.22		2.40	.87			.01	.13					.48	.61	.04	1.28		.45	1.33	.91	.46	.19	.89	.62	.19	1.74	14.40
Saltville [1]				.12		.08	.44		.89	.49			.17	.11				.02	.20	.81		.58	.11	.23	.54	.52	.95		.31	.13	.06	.74	7.50
Swords Creek [1]				.16		.12	.33	.12	.62	.40				.16				.15	.17	.60		.85	.17	.21	.63	.68	.46		.28	.21	.31	1.10	7.73
Wytheville [2]			T	.08	.14	T	.32	.08	1.00	.04		.12	.08	.01			.02	T	.79			.27		.68	.23	.99	.28	.10	T	.08	T	.22	5.53
KENTUCKY																																	
Western Division																																	
Birmingham				.44	.21		1.08			33				.47		1.43	1.02					1.18		2.74				3.91	2.93			2.52	18.26
Calhoun			.40	T	.02	.41	1.11		.38				.08	.68	.02	1.35	1.30	.01		.02	.88	.59		.60	1.48		.52	4.38	3.10	.94	3.60	.09	21.96
Earlington			.37	.01		.73	.99		.23				.05	.71	T	1.53	1.42			.04	.75	.80		.85	1.53		.50	4.93	4.08	1.49	3.49	.25	24.75
Fords Ferry Dam 50 [1]			T	.45	T	T	.95		.32				T	.96	T	.87	1.38	.10	T	T	.32	1.72		.23	1.63		.14	3.29	2.47	1.70	.70	1.41	18.64
Greenville			.42		.04	.30	.80		.25				.05	.45		.90	1.20	T		.02		1.15		1.10	1.45		.45	4.02	3.20	1.25	2.78	.45	20.28
Henderson			.38	.02		1.02	.58		.52				.15	1.30	T	2.02	.30	T	.12	.06	4.00	.12		.57	1.57		.92	4.15	2.87	.17	1.89		22.73
Hopkinsville			.64	.02	.01	.26	.74		.46				.02	.79		.63	1.09	T	.04	.04	.09	1.07		1.91	1.81		.96	4.14	3.88	.89	3.11	.55	23.15
Lovelaceville			.82			2.00							.90		.15	2.20	.90				1.77			1.80			.97	5.21	3.40				20.12
Mayfield			.61	.02	T	.91	.07		.19				.09	.62	T	1.51	.58		.15	.03	.45	.29		.83	1.57		.31	4.55	3.20	.40	1.75	.16	18.29
Murray			.54	T		1.45	.17	T	.33				T	.58	T	.87	.93	.10	.14	.07	1.10	.18		3.76	.36		.60	5.88	T	1.97	1.39	1.28	21.70
Owensboro, Dam 46 [1]				.44	.02	.01	1.20		.26	T			T	1.15		.37	1.01	.10		.01	.27	1.46		.26	1.70	.01	.08	3.15	2.55	.73	.53	2.22	17.53
Paducah			.18	.34	.02	.04	1.06		.29					.69		1.40	1.38		T	T	.27	.80		.18	1.50		.17	3.45	3.72	1.90	.95	.45	18.79
Princeton			.37	.05	.03	1.11		.15	.15				.15	.50	.05	1.40	.88	.08	.02	.05	.90	.30		1.47	1.05	T	.40	5.10	3.50	.40	2.63		20.74
Rumsey, Lock No. 2 [1]				.38	.05		1.54		.30					.72		.60	1.70	.18			.30	1.20		.28	1.78		.18	2.77	4.52	1.98	.25	1.17	19.90
Russellville [1]				.67	.05	.11	.73		.45			.03		.13		.15	1.80	.15	.14	.03	.07	1.04		.55	3.60		1.05	1.90	2.73	1.80	1.02	1.16	19.36
Uniontown, Dam 49 [1]			.03	.29	.02	T	.75		.22	T	T			.54		.94	1.19			T	.50	3.36		.11	2.00		.25	2.18	1.98	2.15	.62	1.25	18.38
Central Division																																	
Addison, Dam 45 [1]				.50	.02	.02	.98		.43	.01				1.07		.34	1.68	.24		.01	.26	1.65		.24	1.94		.19	3.28	3.68	.82	.80	2.18	20.34
Anchorage			.55	.05	.26	.85			.25			T		.78		1.46	.96				2.75	.05		.50	1.10		(3)	5.58	(3)	(3)	6.32	.27	21.73
Bowling Green			.75		.10		1.05		.92			T		.42		.05	1.77	.28	.22	T	.05	1.22		.82	3.75		.82	2.50	2.60	2.30	.80	.75	21.17
Brownsville, Lock No. 6 [1]				.88	.08	.12	1.25		.58					.52		.10	2.08	.30	.03	.04	.03	.97	.02	.45	3.50		.40	1.65	3.25	2.43	1.26	.50	20.44
Burnside [1]				.82	T	.09	1.06		2.63	.09				.66	.02		.14	.42	.17	.05	T	1.62	T	1.33	1.59	.17	1.50	.55	.73	1.68	.22	.78	16.32
Carrollton, Lock No. 1 [1]				.25		.40	.44		.35					.68		.53	1.04	.07			.33			.23	1.44		1.80	2.23	2.93	1.08	.85	2.20	16.85
Cold Spring, Dam 36 [1]				.42	.02	.48	.69		.29	.13				.43	.01	.23	.75	.16				.16	2.87	.01	1.72	.07	.08	2.10	2.26	.34	.15	2.58	15.95
Danville			.80	.08	.16	.95		1.25				T	.10	.43		.44	1.65	T	T	.09	.07	1.23		1.58	1.70	T	1.17	1.60	1.25	.75	1.65	.75	17.70
Dix Dam, Burgin [1]			.85	.10	.12	.70		1.03					.68		.12	1.75	.42		.05	.03	1.10		.40	3.10	.02	.54	1.12	1.76	1.62	.96	.80		17.27
Eadsville [1]				.84			.94		3.04					.43			.08	.50	.18	.04		1.45		.70	2.15		.28	1.75	1.43	1.32		1.15	16.28
Eubank				.60					1.90					1.16			.71			.17	.15	1.60			2.30	.09	1.40	.90	1.00	1.30		1.20	14.48
Frankfort [1]				.48	T	.20	.92		.63	.11			.01	.70		.24	2.00	.44		.05	.16	1.27		.33	1.41	T	.18	3.21	2.58	1.17	1.10	.77	17.96
Gest, Lock No. 3 [1]				.45	.03	.19	.85		.52	.11			.02	.92		.32	1.50	.29		.03	.31	2.35		.32	1.37		.30	1.50	3.57	1.50	1.40	1.55	19.40
Glasgow			1.02		.40	.06	.87		1.57				.28			.60	1.22	.22	.08		.12			4.20	1.80		2.00	1.55	2.00	1.12	1.80		20.91
Grant, Dam 38 [1]				.02	.10	.33	.46		.24	.16				.29		.24	.94		T		.84	2.17		.12	1.61	.03	.18	2.21	2.50	.73	.37	2.79	16.33
Greensburg			.12	.59	.07		.79		1.25	T			.10	.40		.31	1.50	.06	.12	.09	.05	1.06		1.96	2.01		1.91	1.83	1.68	.90	1.54	.66	19.00
High Bridge, Lock No. 7 [1]				.53	.07	.14	.81		.93	.03				.61		.03	1.81	.31		.02	.07	1.23		.32	3.04	.02	.41	1.01	1.78	.92	.01	.85	14.95
Irvington			.59	T	T	.22	1.11		.33			T	T	1.26		.90	1.55			.06	.21	1.15		.51	1.32		.62	3.54	2.93	1.00	1.65	.43	19.38
Lancaster [1]			.70	.04	.17	.95			1.30					.64	.03	1.50	.38	.04		.03	1.60		.40	2.46	.02	.85	1.05	1.65	1.78	1.77	1.05		18.41
Leitchfield					.25	.17	1.15		.30				.06	.75	.02	.68	1.32	.02		.15	.30	1.04		1.32	1.51		.90	3.79	3.65	.93	3.60	.63	22.54
Lexington [2]			.56	.01	.19	.88	.05	.31	.71			.01	.44	.12		1.53	1.50	T		.11	1.10	.10		1.58	.63	T	.70	2.10	1.88	.19	1.61	T	16.31
Little Hickman, Lock No. 8 [1]				.60	.08	.32	.85		1.10					.60		.08	1.45	.44		T		1.25		.45	2.00		.70	1.08	1.42	1.43	1.30	.90	16.05
Lockport, Lock No. 2 [1]				.55	.05		1.07		.52	.40				.97	T	.57	1.76			T	.52	2.72		.36	1.55	.25		1.80	2.70	5.30	3.15		24.24
Louisville [2]			.40	.05	.14	.78		.07	.31				.95	.05	T	1.62	.70	T	T	.09	2.71	.02		1.46	.47	T	1.70	3.68	1.76	.06	3.11		20.13
Mammoth Cave			.92	.13	.17	.21	1.12		.80				.09	.42		.55	2.03	.09	.05	.15	1.96	.45		2.63	1.35		2.25	2.17	2.20	1.03	1.16	.40	22.33
St. John			.76	.03	.25	.82	.30	.10	.35			T		.68		1.24	.98				.70	.80		1.65	1.36		.75	4.10	4.05	1.05	4.00	.12	24.09
Salvisa, Lock No. 6 [1]			.03	.60	.11	.36	.80		.80	.16				.70		.15	2.38	.40		T	.10	1.10		.40	2.30	T	.30	1.10	2.30	1.30	.80	.90	17.09
Shelbyville			.42	.11	.16	.14	.98	.03	.41	.03			.17	1.09	T	.90	1.30	T	.02	.06	1.55	.91	T	.58	1.34	.05	.61	3.20	2.96	.80	2.50	.95	21.27
Shepherdsville			.49	.02	.36	.12	.72		.37				.19	.80		.94	1.06			.05	.53			.83	.85		.57	(3)	6.02	.90	.18	4.02	19.02
Stearns			.54				.27	2.42				.08					.47	.44	.14			.98		.68	1.69	.62	.78	.20	.48	1.30	.05	1.00	12.14
Taylorsville			.07	T	.01	.10	1.37		.46			T	.21	.62		.94	1.49	T	T	.18	.31	.95			1.45		.48	3.22	(3)	(3)	7.36		19.22
Tyrone, Lock No. 5 [1]				.65	.20	.10	.78		.70	.09			T	.48	T	.25	2.10	.45		.06	.08	1.15	T	.41	1.70	.03	.20	1.10	2.85	1.62	.85	.80	16.65
Williamstown			.55	.10	.11	.60	.95		.40	.20			.12	.70		.80	1.20			.08	1.40	.80		.35	1.20		.70	2.10	2.60	.96	2.10	.73	18.75
Woodbury, Lock No. 4 [1]				.72	.02	.07	.89		.32					.61		.18	1.28	.08	.03		.03	1.12		.36	3.10		.66	1.80	4.52	1.82	.96	2.00	20.57
Eastern Division																																	
Annville				.75		.02	.65		2.17	.03				.45			.14	.37	.14	.01		1.89		.46	1.69	.30	1.02	.62	.56	1.31	.40	.78	13.76
Ashland [1]				.33	.08	T	.39		.65	.13				.81			.99	.51		.02		1.24	.02	.01	1.94	.25	.30	.44	.45	1.73	.73	1.11	12.13
Berea				1.02	.03		.86		1.20				.24	.94		.20	1.25	T		.18	.18	1.44		1.14	1.43	.06	1.46	1.16	.79	.90	.85	.99	16.32
College Hill, Lock No. 11 [1]				.50	.05	.09	.70		1.25					.72			.67	.30	.08	.03		1.23		.37	2.02	.03	.66	.85	1.08	1.15	1.25	.70	13.73
Cumberland				.57	.05		.73	T	1.44	.12			.04						.64	.14	T	1.32			2.19		T	.78	.07	.85	1.44	T	10.38
Falmouth [1]			.01	.41	.02	.32	.84		.42	.16		T		.72	T	.33	1.41	.31		.02	.18	1.76		.30	1.28	.02	.17	1.32	.98	(9)	[10].25	[10].35	
Farmers [1]				.05		.06	.75		1.05					.95			1.23	.39				1.58		.20	2.00		.50	.62	.99	1.63		.83	12.83
Flemingsburg [1]			.39		.18	.19	.70		.82		.26			.70		.10	2.60	.52				1.24		.24	1.36		.41	.63	1.65	.45	.70	1.09	14.23
Ford, Lock No. 10 [1]				.54	.01	.16	.90		1.02	T				.75		T	1.56	.47	T	.02	.03	1.20	T	.29	2.39	T	.52	.84	1.14	1.50	.98	.92	15.24
Hazard [1]			.60			.05	.68		1.60	.07				.38			.05	.28	.20			1.30		.36	1.00	.41	.91	.25	.30	1.03	.05	1.20	10.72
Heidelberg, Lock No. 14 [1]				.51			.81		1.70	.15				.46			.40	.46	.11			1.39		.22	2.00	.41	.77	.95	.64	1.21	.39	.66	13.24
Jackson				.42		.05	.64		2.50					.45			.25	.35	.15			1.40		.60	1.20	.50	1.30	.30	.50	1.00	.08	1.18	12.87

[1] Precipitation for 24 hours ending in the morning.
[2] Precipitation for 24 hours ending at midnight.
[3] Included in the next following measurement.
[9] 4.0 inches snowfall, rain and melted snow not measured.
[10] Estimated.

TABLE 7.—*Daily amounts of precipitation (inches and hundredths) at selected stations in the Ohio River watershed, Dec. 25, 1936, to Jan. 25, 1937*—Continued

	December 1936							January 1937																									Total
	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
KENTUCKY—contd.																																	
Eastern Division—Con.																																	
Jenkins [1]				0.50	0.03		0.86		0.92	0.43				0.25				0.17	0.19	0.09		1.37	0.03	0.83	0.53	0.69	0.40	0.09	0.18	0.61	0.50	0.90	9.57
Livingston			0.76		.58	0.51		2.20					0.30			0.19	0.31	.10			0.91	.41		.43	1.80		1.26	.57	.75	.31	1.07	1.05	13.51
Louisa [1]				.48			.42		.93	.18				.68			.51	.53				1.23			2.00	.53	.41	.63	.51	1.10	.51	.85	11.50
Maysville [1]				.46	.02	.22	1.14		.55	.07				.86		.04	2.16	.55			.08	1.38		.06	1.41	T	.25	.75	2.55	1.73	.62	1.25	16.15
Middlesboro					.20	.04	1.00	.04	2.85			.03		.04	0.03		.10		.53	.16		1.35		.78	1.08	.06	.50	.30	.32	.88		1.60	11.89
Mount Sterling			T		.20				1.00				T	.80		.35	1.64	T		T	T	2.25	.75	.25	T		.76	1.00	.87	.80	1.50		12.17
Oneida				.94		.07	.84		1.93					.31				.47	.18			1.74		.45	1.27	.54	1.12	.11	.51	1.20		1.48	13.16
Oneonta Dam 35 [1]				.47	.07	.21	.61		.22	.18				.51	T	.24	.90	.20		T	.18	2.40		.08	1.50	.02	.06	1.98	2.92	.54	.66	2.43	16.38
Paintsville [1]				.49		.06	.44		1.71								.21	.43	.09	.02		1.11		.23	1.14	.66	.42	.66	.53	1.15	.13	.96	10.44
Pikeville [2]				.27			.58		1.30				.15	.10		T	.23	.01	.17			1.38		.73	.88	.03	.84	.25	.08	.81	.02	1.10	8.93
Pippapass				.34	.05		.68		1.61				.01	.20			.22	.03	.14	T		1.31		.85	.72	.09	.85	.25	.09	.75		1.26	9.45
Quicksand [1]				.47			.70		2.46					.61		.24		.33	.17			1.52	.60	1.02		.56	.69		.49	.55	.90	.07	11.38
Ravenna, Lock No. 12 [1]				.46	T	T	.67		1.35	.12				1.15		T	.83	.34	.12	.07		1.20		.41	1.90		.82	.77	.79	1.44	.96	.68	14.08
Richmond				.65	.20	.20	.75		1.10					.70	T	.10	1.50	.15	.10			1.30		.40	2.25		.80	.80	1.20	1.60	2.00	1.00	16.80
Valley View, Lock No. 9 [1]			T	.58	.03	.25	.80		1.01		0.03		.73		T	.05	1.60	.38		.03		1.45		.45	2.48	T	.58	1.05	1.40	1.50	.83	.96	16.19
Vanceburg, Dam No. 32 [1]				.43	.03	.13	1.00		.68				.03	.50		.02	2.13	.56		.03	.03	1.26		.05	1.40	.03	.10	.82	1.65	1.23	.65	1.10	13.86
Williamsburg [1]				.48	.35		.94		2.00	.30			.02	.11				.36	.30	.20		1.59	.03	.75	1.38	.30	.66	.15	.38	1.35	.10	1.16	12.91
Willow, Lock No. 13 [1]				.56	.05	.02	1.00		1.90					.75			.51	.55	.12			1.25		.75	2.00	.34	1.25	.85	.82	1.50	.30	.72	15.24
TENNESSEE																																	
Eastern Division																																	
Bluff City [1]				.25	.35		.42	.15	.98	.75			.21	.05				.05	.65	.70		.71	.15	.34	.41	.82	1.18				.15	.45	8.77
Charleston [1]				1.20	.28	.01	.81		1.25	.79		.07	.26	.15	.04			2.03	.29	1.01		1.22		.57	.80	.92	.37	.03		.16	.16	1.51	13.93
Chattanooga [2]			.24	.79	.29	.99	.40	1.09	2.87			.28	.14	T	.01	T	.15	.03	.82		.13	.86	T	.64	.82	.31	.03	.02		.23	1.48	.23	12.85
Clinton [1]				1.45	.12	.13	.81		2.80	1.29			.16	.13				.15	.70	.58		1.51		.52	1.32	.73	.39	.01	T	.40	.17	2.00	15.37
Copperhill [1]				.53	.89	.02	1.20	.95	2.00		.02	.48	.17	.02	T		.20	.16	.43	T	.91	T	.48	.56	1.10	.52	.07	.03	.06	.04	1.22	T	12.06
Dandridge [1]				.55	.16	.05	.66		.51	1.45			.29	.08	.03			.11	.77	.84		1.01	T	.30	.40	.78	.28	.08	.04	.29	.02	1.14	9.84
Decatur			T	1.07	.14	T	.92	.03	2.80	.89		.26	.06	T	.03	T	.16	.03	1.15	.29	.05	1.20		.80	1.31	.08	.33	T		.40	.01	2.05	14.06
Dunlap [1]				.80	.20	.27	1.65		3.25	.65		.15		.22					.75	.50		1.75		.50	.60	.45	.50	.05	.05	.50	.08	2.50	15.42
Elizabethton [1]				.25	.10		.47		1.05	.24		T	.25				T		1.10	.23		.60		.46	.46	.57	.14	T				.61	6.53
Elkmont				.67	.03		1.03		1.97	.12		.28	.07				.07	.06	1.27	.74		1.39		.31	1.41	.34	.14	.01		.08		1.54	11.53
Embreeville [1]				.35	.14	.11	.36	.04	.60	.81			.28	.02	T			.11	.79	.59	T	.71	.12	.42	T	1.08	.32	T	T		.05	.66	7.56
Erwin [1]				.41	.10		.55			.38		.27	.07						.95	.30		.57		.35	.60	.84	.08					.43	5.90
Etowah			.02	.93	.36	T	.78	.20	2.10	.55		.35	.10				.15	.05	1.35	.24	T	1.43		.42	1.76	.15	.30	.15		.20		1.00	12.59
Gatlinburg [1]			.61		.09		.72	T	1.55	.56		.29	.11					.08	1.40	.55		.89		.34	1.18	.38	.15			.05			8.95
Greenville (near)				.47	.13		.61	T	1.30	.36		.25	.03					.14	1.20	.35		1.03		.28	.68	.35	.33	.06		.08	T	1.05	8.70
Kingsport [1]			.18	.33	.08	.04	.45		.43		.70		.12						.60	.64		.75	.04		.92	.32	.25		.05	.12	.04	.90	6.96
Kingston [1]				1.40	.10	.20	.90		2.90	1.00			.20	.10	.02			.25	.60	.60		1.65		.60	1.60	.45	.35	.02		.35	.10	2.00	15.39
Knoxville [2]			.21	.65	.22	.16	.70	.64	1.98	T		.28	.03				.09	.48	1.43		T	1.03		.76	1.32	.19	.11	.05	T	.43	1.02	.70	12.48
London [1]				.82	.21	.03	.98		1.42	1.49		T	.26	.07		.03		.32	.92	1.20	T	1.28		.44	1.04	.79	.37	T	T	.43	.14	2.40	14.64
McGhee [1]				.96	.41	.07	.96		1.25	1.14		.04	.24	.14				.23	.66	1.05		1.24		.52	1.02	.90	.30	.19		.17	.19	1.53	13.21
Madisonville				1.23	.35	3.00		.70	1.80	.47		.10	.42	.60			.28	1.70			.62	.58	.38	.59	.50	.44		.08	.15	.30	.03	1.90	16.22
Morgan Springs [1]				1.37	.37	.38	1.30		3.29	.77		.07	.19	.10	.03			.21	.72	.62		1.76		.69	2.35	.22	.37			.55	.17	2.21	17.69
Morristown				.75	.31		.83	.14	1.38	.15		.25	.02	T	.03		.03	.15	1.32	.16		1.15		.65	1.02	.14	.32	.09	.01	.24		1.34	10.50
Newport [1]				.40	.12	.02	.70	.05	.49	1.50			.34	.04	.03			.13	.65	.76	.04	.74	.15	.31	.05	.76	.30	.06	.07	.04	.08	.88	8.76
New River [1]				.47	.34		.48		4.42	.37		.11		.39		.25	.44			.33		2.30	.23		2.71	.34	.11	.27	.16	1.77	.22	2.73	18.37
New Tazewell (near) [1]				.82	.07	.05	.92	.03	2.18	1.14	.03	.02	.02	.07				.03	.10	(3)	(3)	(3)	(3)	2.37	1.30	.64	.40		(3)	(3)	(3)	2.37	12.61
Norris				1.08	.08	.11	.98	.04	3.16	.99	.08	.04	.03	.08				.05	.60	.73	.04	1.04	.04	.54	1.31	.57	.42	.04	.02	.50	.29	1.71	14.51
Parksville [1]				.65	.51		.85		1.50	1.25		.08	.36	.12	.03			.29	.25	.76		1.31		.44	1.91	.20	.20	.08			.15	1.22	12.19
Rogersville [1]				.55	.16	.10	.65		.76	.82			.20	.07				.10	.53	.76		1.00		.40	.80	.67	.44	T	.06	.12	.07	1.26	9.62
Rugby				1.2		.25	1.24		3.30			T	.20				.23	.05	.63	.26	.70	1.31		1.22	.75	.24	.55	.55	.13	1.58	.06	1.32	15.82
Sneedville [1] (near)				(3)	.90		1.00		(3)	3.13				.14					.24	.48		1.16		(3)	(3)	2.50	.36	.40		(3)	.76	1.97	13.04
Tellico Plains				.65	.55		1.25		1.05	1.64		.20	.25	.15				.18	.54	1.22		1.26		.24	1.14	.54	.52	.12	.08	.21	.13	1.48	13.40
Central Division																																	
Ashwood			.10	.75	.55	.27	1.40	.32	3.00			.08	.40			.11	.40	.13	.50	.08		1.00		1.10	.75		.98	.40	.05	1.15	.10	.30	13.92
Buffalo Valley [1]				1.52	.16		1.20	.15	2.75			T	.38	.06		T	.24	.17	.75	.10	.26	1.49		1.77	.80		1.04	.84	.09	1.00	T	1.34	16.11
Byrdstown [1]				1.14	.10		1.11		3.29			.27						.35	.32	.27		2.38		1.45	1.43	.18	1.56	.33	.15	1.85	.15	1.49	17.82
Carthage [1]				1.07	.10	.11	1.13		3.45				.06	.52			.04	.24	.42	.57	T	1.17		1.21	1.60		1.52	.48	.51	1.48	T	1.12	16.80
Cedar Hill			.70	.15	.26	.39	.81	.05	1.45			.04	.25	.18	T	.45	.77	.11	.26	.05	.47	.65		4.25	1.25	.02	2.63	2.35	2.90	1.30	1.63	.33	23.70
Celina [1]				.87	.07	.09	1.10		2.00					.55			.08	.44	.29	.18		1.32		1.18	2.00	.08	1.61	.50	.64	1.50		1.30	15.80
Clarksville [1]			T	.54	.06	.15	.74		.89				.07	.20		.19	1.47	.44	.14	.15	.03	.98		.99	4.21		1.04	2.84	3.28	2.27	1.07	.98	22.73
Cookeville				1.56			1.07	.22	3.43			.02	.33				.23	.15	.82	.10	.56	1.99		1.58	.80	.13	1.25	.43	.12	1.28	T	.89	16.96
Crossville (near)				1.57	.16	.28	1.53	.28	2.70			.05	.02	.01			.31	.18	1.01	.09	.15	1.33		.72	.94	.12	.44	.04	.04	1.05	1.00	1.58	15.60
Dickson			.94	.57	.23	.34	.64	.04	1.84			.10	.33	.06	.08	.19	.85	.34	.65	.04	.18	1.08	.04	2.92	.77	.09	2.15	1.14	1.20	1.04	.98	.30	19.13
Dover			.56	.07	.01	.27	.62		.70			.02	.05	.21		.42	.58	.06	.11	.12	.34	.89		3.50	3.54		1.23	3.81	3.02	.78	3.60	.37	24.88
Fayetteville [1]				.92	.02		.98		4.00			.02		.19				.78	.48	.68		1.70		.22	.69	.29	1.05	.05		.88		1.10	14.05
Franklin			.60	.45	.30	.40	1.05	.35	2.40				.40	.03	T	.12	.03	.22	.75	.09	.14	.80		1.72	.88	.10	2.10	1.05	.20	1.50	.40	.20	16.28
Hohenwald [1]				1.76	.59	.15	1.10		2.88				.14	.66			.29	.39	.47	.50	.22	1.21		1.29	1.23	.17	2.20	.42	.03	1.59	.14	.52	17.95
Johnsonville [1]				.93	.30	.02	.74		.92	.02				.20		.25	1.20	.20	1.10	.61	.07	1.37		.79	3.84		1.35	3.64	2.65	2.51	1.03	1.37	25.11
Lewisburg			.61	.60	.05	.45	.65	1.00	2.52			.06	.32	.01		.07	.59	.27	1.00	.01	.05	1.54		.51	.72	.10	.67	.01	.10	1.32	1.03	.34	14.60
Liberty [1]				1.43	.15	.33	1.05		3.93			T		.33			.01	.34	.41	.71		1.69		.95	1.21		1.01	.46	.36	1.23	.07	1.49	17.16
Lock A, Cumb. R. [1]				.90	.15	.15	1.02		2.60					.33		.09	.94	.06	.68	.33		1.17		.74	3.56		1.70	2.18	2.06	2.09	.72		21.47
Lock 3, Cumb. R. [1]				.81	.05	.07	1.09		1.98				.02	.76			.12	.33	.56	.55	.10	.98		.91	2.32	.26	2.35	.55	.78	1.55	.09	.40	16.63
Lock 5, Cumb. R. [1]				.70	.22	.02	1.26		2.10				.02	.83			.20	.38	.48	.42	.20	1.27		1.20	2.12	.15	1.82	.70	.55	1.57	.30	.21	16.72
Lock 6, Cumb. R. [1]				.67		.37	1.20		2.12					1.01			.14	.34	.46	.40		1.29		1.12	2.39	.51	1.71	.52	.60	1.42	.03	.59	16.89
Loretto				1.55	.23	.03	1.34		3.52			.06	.06	.61	.01	.02	.02	.41	.51	.75	.13	1.05		1.05	.69	.03	.97	.06		1.42	.03	.42	14.97
Lynnville (near)			.01	1.17	.03	.12	1.18	.43	2.69			.09	.50	.04	.01	.03	.61	.14	.92	.18	.01	1.44		1.00	.65	.04	1.12	.21	.01	1.50	.14	.28	14.55
McMinnville				1.00	.02	.03	1.04	.61	2.98			.03	.14	.03			.43	.32	1.20	.10	.22	1.53		.39	.94	.25	.70	.13	.05	1.05		1.15	14.34
Madison College			.61	.21	.10	.24	.89		2.00		T	T	.71		T	.19	.49	.42	.58	.06	.26	.75		2.66	.77	.29	2.45	.84	.76	1.48	.56	.15	17.47
Monterey				1.37		.15	1.15		3.85				.28	.02			.22	.11	.85	.13	.63	1.67		1.37	.88	.28	.88	.63	.06	1.34	.07	1.43	17.37
Nashville [2]			.77	.04	.05	1.10		.53	1.13			T	.55	T	T	.12	.30	.26	.46	T	.99	.04	.03	2.09	.95	.18	2.22	.77	1.88	.48	.59		15.53
Palmetto			.25	2.20				.90	2.90			.08	.37	T		T	.43	.43	1.08	.03	.75	.95		.37	.90	.92		.03	.05	1.10	.20	.08	14.02
Rock Island [2]			.86	.39		.93	.10	1.60	2.10			.04	.36				.46	.70	.65		1.56	.64		.63	.85	.58	.50	.20	.14	.95	1.25	.03	15.52
Sewanee [1]				.76	.27		1.24	.78	2.14			.10	.23						.76	.53		1.39			1.24		.66	.10		.08	.65	1.50	12.43
Sky Harbor [1]			.09	.14	.09	1.01			4.16			T	T	.58			.04	.34	.36	.44	T	1.09		.48	1.85	.01	1.67	.25	.53	1.48	.03	.57	15.21
Tullahoma			.05	.92	.07	.11	1.37	1.10	2.98			.07	.10	.01			.46	.20	1.03	.04	.05	1.44		.50	.73	.29	.95	.05	.05	.86	.30	.96	14.69
Worsham			.60	.21	.20	.31	1.10	.13	1.82		T		.65	.12		.15	.61	.25	.73		.07	1.15		3.62	.98	.18	2.72	1.03	1.25	1.07	.73	.20	19.88

[1] Precipitation for 24 hours ending in the morning.
[2] Precipitation for 24 hours ending at midnight.
[3] Included in the next following measurement.

TABLE 7.—*Daily amounts of precipitation (inches and hundredths) at selected stations in the Ohio River watershed, Dec. 25, 1936, to Jan. 25, 1937*—Continued

	December 1936							January 1937																									Total
	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
TENNESSEE—continued																																	
Western Division																																	
Bolivar	----	----	----	1.18	----	----	0.99	----	1.60	----	----	0.04	0.09	----	----	0.51	0.73	0.11	0.61	0.08	0.24	1.12	----	2.00	.50	0.05	1.91	1.88	1.40	1.23	1.20	0.08	17.55
Brownsville [1]	----	----	T	1.09	.09	0.10	1.63	----	1.09	----	----	----	T	0.38	----	.25	.63	----	.86	.12	.04	1.16	----	.71	2.52	----	1.54	3.09	3.47	1.62	2.37	1.41	24.17
Covington [1]	----	----	0.40	.70	.04	.05	2.40	----	.90	----	----	----	.05	.10	----	.10	1.00	----	1.05	.02	.10	.90	----	.80	3.10	----	.80	2.30	4.50	1.10	1.90	1.00	23.31
Dresden [1]	----	----	.64	.32	.11	1.20	T	0.74	----	----	----	T	.74	T	T	1.05	.65	.14	T	T	2.35	1.43	.98	1.54	2.25	1.73	2.02	1.30	1.30	.65	1.70	----	22.84
Halls	----	----	.83	.55	----	----	1.25	----	----	0.52	----	----	----	.60	----	.60	.42	----	.10	----	----	.70	----	.70	4.00	----	.75	2.51	1.90	3.05	1.50	.65	20.63
Jackson [1]	----	----	----	.70	.25	.01	.86	----	1.08	----	----	.04	----	.02	0.01	.25	.78	.25	.58	.23	T	1.29	----	.80	1.98	.03	1.73	3.43	2.44	1.88	1.58	1.43	21.65
McKenzie	----	----	.60	.06	----	.98	----	----	.58	----	----	----	.10	.06	----	.68	.53	.19	.47	.08	----	1.05	----	3.69	1.88	----	1.08	5.38	3.06	([3])	4.40	----	24.87
Martin	----	----	.68	.05	.02	.88	.10	----	.31	----	----	T	.20	.56	.04	.86	.65	.08	.24	.04	.24	.35	----	2.68	2.41	----	.68	5.52	3.77	1.55	2.22	.09	24.22
Memphis [2]	----	.01	1.17	.03	T	2.12	----	1.60	.04	----	----	.03	.19	----	.14	.36	.32	.68	.26	----	.87	----	T	2.59	.02	.22	1.97	2.82	2.02	.38	2.74	----	20.58
Milan [1]	----	----	----	.71	.16	----	2.08	----	.39	----	----	----	.08	.18	----	.11	.50	.15	----	.53	.59	T	.96	1.38	2.53	T	.70	1.90	2.06	1.66	1.80	2.08	20.55
Moscow	----	----	.80	.93	----	1.63	.12	.88	----	----	----	1.29	.06	----	----	.36	.71	.19	.38	.05	.25	.87	----	1.80	.48	.05	1.44	1.10	1.50	1.11	2.08	----	18.08
Newbern [1]	----	----	.88	.06	1.13	----	----	.34	----	----	----	.03	.70	----	----	----	----	.19	.18	.05	.57	----	.98	4.70	----	----	.78	3.43	2.15	.56	1.10	----	17.83
Perryville	----	----	.85	.95	.03	.29	.71	.20	2.21	----	----	----	.58	.10	----	.28	1.00	.28	.72	.05	.75	.48	----	2.66	.49	.71	1.85	.80	.98	1.27	.52	.11	18.87
Savannah [1]	----	----	----	2.15	.09	.01	.88	----	4.55	----	----	.03	.28	.23	----	.07	.38	.16	.40	.55	.03	1.03	----	1.25	.65	.09	1.95	.15	.03	1.15	.29	.37	16.77
Selmer [1]	----	----	----	1.51	.16	----	.88	----	4.00	----	----	.01	.25	.16	----	.11	1.09	.11	.42	.34	.03	1.28	----	----	.63	.05	1.85	.27	.36	1.53	.28	.60	15.92
Tiptonville	----	----	.84	.04	.02	1.57	----	----	.37	----	----	T	.53	.29	----	1.68	.18	.30	.13	.04	.46	.08	----	1.46	1.16	T	.74	4.75	3.69	.06	1.67	----	20.06
Union City [1]	----	----	.58	.27	.02	.05	1.65	----	.31	----	----	----	----	.72	----	1.48	.76	----	.03	.10	.20	.34	----	.37	2.70	.32	----	3.20	4.17	1.19	.87	1.28	20.61
Wildersville	----	----	----	.98	.02	T	.65	----	1.08	----	----	----	T	.11	----	.27	.77	.18	.50	.08	.05	1.28	----	1.05	1.84	----	2.80	2.07	1.85	1.95	1.40	1.15	20.08
WESTERN NORTH CAROLINA																																	
Andrews	----	----	----	1.05	1.10	.04	1.23	----	1.08	1.93	----	.60	.40	.01	----	----	----	.02	.66	.12	----	.82	----	.34	.24	----	1.55	.03	----	.05	.09	1.31	12.67
Asheville [2]	----	T	.03	.59	.08	.32	.47	.79	1.22	.18	----	.45	.14	----	.03	T	T	T	.62	----	T	.53	----	.23	.34	1.00	.17	T	----	T	.09	.10	7.38
Boone	----	----	----	.17	.32	.17	1.15	.01	1.00	1.00	----	.20	.40	.20	----	----	----	.01	.34	.49	.50	.37	----	.52	.22	.03	----	.10	----	.03	----	.25	7.48
Brevard	----	----	----	.66	.54	.61	2.00	----	2.76	.93	----	.64	.46	----	.12	----	----	.08	.03	.08	.14	.53	----	.42	.84	1.41	.80	.17	.05	----	.30	.53	14.10
Bryson City [1]	----	----	----	.76	----	----	1.52	.03	.92	1.71	----	----	.71	----	----	----	T	----	.87	----	----	----	.80	.50	----	1.63	----	----	----	.17	----	.19	9.81
Franklin	----	.01	.06	.58	.57	.13	.92	.89	1.99	.20	----	.62	.21	.01	.02	----	.01	.20	.21	----	----	.82	----	.60	.53	.81	.07	.01	----	.03	.04	.59	10.13
Hendersonville	----	----	T	.70	.60	.36	1.69	----	2.50	.72	----	.60	.42	.07	.06	----	----	.03	----	.15	.04	.43	----	.56	.40	1.44	.78	.09	T	----	.14	.24	12.02
Hot Springs [1]	----	----	----	.34	.10	----	.57	----	.55	1.30	----	----	.30	.05	----	----	----	.02	.44	.75	----	.53	.03	.23	.14	1.15	.30	----	----	----	.04	.70	7.54
Jefferson	----	----	----	.19	.35	.15	1.05	.01	1.45	.80	----	.14	.30	.09	----	----	----	.02	.24	.37	.02	.38	----	.82	.13	1.07	.53	.03	----	----	.05	.18	8.37
Marshall [1]	----	----	----	T	.65	.10	.60	----	.95	1.40	----	----	.45	.15	----	----	----	----	.10	90	----	.40	----	.22	----	1.70	.50	T	----	T	----	.40	8.52
Montreat [1]	----	----	----	.06	.03	.02	.10	.01	.12	.06	0.01	.05	.58	.25	.17	----	----	.01	.01	.74	----	.83	----	----	.40	1.58	.67	.15	----	----	.05	.33	6.23
Mount Mitchell	----	----	----	.51	.38	.95	1.52	.17	1.74	1.70	----	T	.36	.14	.04	----	----	----	.03	.78	----	.44	.31	.37	.51	1.07	.96	.10	----	----	.12	.46	12.66
Murphy [1]	----	----	----	.79	1.17	.01	1.03	----	1.20	2.10	----	.17	.45	.13	.02	----	----	.07	.29	.39	----	.92	.02	.33	.23	1.03	.30	.05	----	T	.03	1.00	11.73
Nantahala	----	----	T	.67	.96	T	.97	.02	1.71	.45	----	1.00	.21	----	T	----	T	.20	.50	.41	----	.85	----	.60	.45	.98	.15	----	----	.26	T	1.24	11.63
Parker	----	----	----	.47	.31	.22	.54	.56	.63	.87	----	----	----	----	----	----	T	----	.69	.39	----	.18	----	.83	.61	.77	.46	.19	.39	.37	T	.78	9.26
Waterville	----	----	.01	.20	.05	----	.58	.54	1.30	.09	----	.25	.03	----	----	----	.01	.33	1.03	.02	----	.65	----	.20	.65	.70	.05	----	----	----	.04	.81	7.54
Waynesville	----	----	----	.40	.40	.15	1.00	----	1.20	2.50	----	----	.35	----	----	----	----	.06	.20	.60	----	.70	----	.42	.22	1.18	.30	----	----	----	----	.55	10.23
WESTERN SOUTH CAROLINA																																	
Anderson	----	----	----	.05	.11	.16	1.01	.40	1.43	1.42	----	.60	.25	----	.06	.02	.01	----	.02	.02	----	.06	----	.75	.19	1.47	.44	.07	----	----	.17	.19	8.90
Caesars Head	----	----	----	1.00	1.47	.55	3.52	----	3.00	1.38	----	.43	.45	.10	.25	.02	.03	.05	----	.05	.25	.80	----	.84	1.15	1.56	1.10	.10	.11	----	.48	.52	19.21
Greenville [1]	----	----	----	.06	1.55	.16	.66	1.03	.64	2.03	T	.03	.62	.10	.05	----	----	----	.10	.05	----	----	.07	.28	.10	1.50	.59	.07	----	.01	T	.14	9.84
Landrum	----	----	----	.78	1.42	.42	2.11	----	2.51	1.74	----	.82	.32	.11	----	.06	----	----	----	----	.18	.22	----	.67	.72	2.16	1.14	.04	----	----	.12	.24	15.78
Walhalla	----	----	----	.98	.63	.43	1.83	.18	2.91	1.02	----	.65	.18	.03	.13	.03	.02	.40	.02	.14	.06	.30	----	.57	.33	1.47	.86	.06	.04	T	.14	.26	13.67
NORTHERN GEORGIA																																	
Blairsville [1]	----	----	----	.50	T	.10	1.40	.10	1.80	.85	----	.60	.15	----	T	T	T	----	----	.25	----	.90	----	.32	1.20	.75	.20	.06	----	----	.07	.85	10.10
Canton [1]	----	----	----	.87	.03	.12	1.13	.17	1.59	2.27	----	.11	.64	.27	.08	----	----	.05	----	.53	----	.38	.01	.42	.32	1.07	.48	.04	T	----	----	1.14	11.72
Carlton Bridge [1]	----	----	----	.12	.05	.12	.58	.18	1.20	2.24	.03	.03	.80	.03	.11	.01	----	----	.02	----	----	.08	.07	.48	.11	.94	.62	.02	.01	.01	.01	.36	8.23
Cedartown	----	----	----	1.09	1.28	2.06	1.60	1.10	2.06	1.60	.02	.60	.30	----	----	----	----	----	----	----	.03	.73	----	.30	.52	.31	.47	----	.03	.05	.02	.96	15.14
Clayton	----	----	----	1.23	1.15	1.28	2.52	----	2.93	1.13	----	.82	----	.34	----	----	----	.25	----	.22	----	.82	----	.71	1.23	1.63	.63	----	----	----	----	.88	17.77
Cornelia	----	----	----	1.18	.63	.43	2.36	.87	1.97	1.02	----	.56	.27	.21	.11	.12	.03	.13	.09	.36	.03	.36	----	.78	.42	1.25	.59	.08	.04	.09	.13	.28	14.39
Dahlonega [1]	----	----	----	.65	1.23	.11	2.01	.06	2.03	2.50	----	.18	.63	.29	.16	.04	.04	T	.13	.29	.01	.31	----	.72	.77	1.20	.55	.06	.16	----	.03	.71	14.87
Gainesville [1]	----	----	----	.32	.79	.32	1.40	.02	1.68	1.49	----	.10	.47	.14	.10	.03	.03	----	.01	.02	----	.15	----	.67	.32	1.19	.44	.05	.02	----	.03	.37	10.16
Gillsville [1]	----	----	----	T	.68	.20	1.48	.10	3.00	2.25	.25	.40	2.21	.05	.14	.05	----	----	----	----	.10	.12	.05	.55	.40	1.20	.77	.05	.05	.02	----	.26	14.38
Hartwell (near) [1]	----	----	----	.01	.03	.02	1.02	----	1.80	2.23	----	----	1.02	.10	.11	.09	.03	----	.06	----	----	.03	----	.47	.41	1.40	.83	.03	----	.05	.30	----	10.04
Lafayette [1]	----	----	----	----	----	----	1.35	----	2.02	----	----	----	.32	.97	----	----	----	.15	----	.55	----	1.05	----	.04	1.20	.41	1.38	----	.01	----	.01	1.90	11.36
Resaca [1]	----	----	----	.88	1.22	.03	1.57	----	1.48	2.70	----	.16	.54	.25	.06	T	----	.16	.03	.35	----	.84	T	.44	.47	1.03	.49	T	.01	.04	.06	1.43	14.24
Rome [1]	----	----	----	.62	1.13	.06	1.32	----	1.62	2.38	----	.24	.61	.42	.02	----	----	.21	.14	.19	----	.66	.04	.49	.16	1.12	.53	.03	.05	----	.16	1.22	13.42
Toccoa [1]	----	----	----	.28	1.13	.10	1.38	.60	2.05	1.76	----	.05	.63	.08	.13	.03	.03	----	.11	.16	.03	.13	.05	.64	.26	1.21	.97	.06	.03	----	.05	.35	12.30
NORTHERN ALABAMA																																	
Albertville	----	----	.03	.17	----	.28	1.98	2.75	3.48	----	----	.72	.18	T	----	----	.37	.06	.68	----	.30	1.20	----	.62	.93	.39	.35	.05	----	.22	T	2.03	16.79
Belgreen [1]	----	----	----	----	----	.36	.75	----	2.65	----	.25	----	----	.15	----	.14	----	.25	----	----	1.30	----	.50	.95	----	.90	----	----	1.20	----	----	----	9.40
Bridgeport [1]	----	----	----	.49	.11	.28	1.08	----	2.10	1.52	----	.06	.22	.08	T	----	----	.18	.22	.99	----	1.43	----	.43	.72	.59	.33	.03	----	.15	.13	2.04	13.18
Decatur [1]	----	----	.03	.18	.03	----	1.53	----	2.33	.06	----	.15	.24	.09	T	T	T	.44	.16	.59	T	1.36	----	.36	.90	.35	.93	.06	----	.92	.90	1.09	12.70
Florence [1]	----	----	----	.69	.20	----	1.09	----	3.09	----	----	.04	.06	.46	----	----	----	.63	.50	.76	.10	1.17	----	.68	.97	.15	.97	----	----	1.68	.02	.40	13.66
Fort Payne [1]	----	----	----	.51	.08	----	1.47	----	1.89	2.41	----	.14	.47	.17	T	----	----	.21	.10	.49	----	1.60	----	----	1.03	.52	T	.38	T	----	.20	2.26	13.93
Gadsden [1]	----	----	----	.37	.43	.19	1.71	----	2.41	2.68	----	.33	.76	.14	----	----	----	.17	----	.34	----	1.28	----	.47	.75	1.22	.51	.25	----	.14	----	2.00	16.15
Guntersville [1]	----	----	----	.15	T	.53	1.85	----	1.80	1.55	----	.19	.55	.03	----	.06	T	.36	.23	.42	----	1.85	----	.45	.56	.70	.57	.07	----	.15	.13	1.95	14.15
Haleyville	----	----	----	.20	.27	.12	1.05	.50	1.82	----	----	.50	.20	.10	T	----	.42	T	1.05	.04	.80	.95	----	.46	1.00	.70	1.00	.05	----	.63	.20	1.12	13.18
Riverton [1]	----	----	T	1.70	----	----	.70	----	2.31	----	----	.11	.05	.61	----	.09	.15	.16	.42	.44	.05	.70	----	----	.78	.05	1.00	----	----	1.40	----	.36	11.08
St. Bernard	----	----	T	.32	----	.23	1.77	.43	2.74	.03	----	.51	.15	.02	T	----	.37	.03	.46	----	.10	1.21	----	.60	1.50	.36	.51	----	T	.30	.84	1.41	13.89
Scottsboro	----	----	----	.26	.01	.14	1.32	.30	4.12	.08	----	.35	.17	----	.01	----	.32	----	.83	.07	.10	1.23	----	.40	1.26	.17	.40	.05	----	.22	.30	1.98	14.09
Tuscumbia [1]	----	----	T	.71	.10	----	.90	----	3.03	----	----	.10	.90	.60	----	T	----	.65	.62	.65	.05	.80	----	.70	.95	12	.90	T	----	1.50	T	.60	13.88

[1] Precipitation for 24 hours ending in the morning.
[2] Precipitation for 24 hours ending at midnight.
[3] Included in the next following measurement.

TABLE 7.—*Daily amounts of precipitation (inches and hundredths) at selected stations in the Ohio River watershed, Dec. 25, 1936, to Jan. 25, 1937*—Continued

	December 1936							January 1937																									Total
	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
NORTHERN MISSISSIPPI																																	
Batesville[1]	----	----	0.05	0.74	----	----	0.89	----	2.51	----	----	0.25	0.11	0.15	----	0.22	0.55	0.20	0.42	.28	----	1.28	----	0.64	0.26	----	0.91	0.09	0.06	1.26	----	1.73	12.60
Booneville	----	----	1.05	.87	0.27	0.39	.25	0.95	1.21	----	----	.25	.57	----	----	----	.70	.07	.59	.07	0.86	.29	----	.67	.76	0.18	.70	.02	.18	1.26	0.14	.19	12.49
Clarksdale[1]	----	----	.02	.77	T	T	1.05	T	2.07	----	----	.29	.25	.03	----	.11	.32	.42	.28	.39	.02	1.29	----	1.55	.27	.01	1.51	.41	.50	1.55	.61	1.14	14.86
Corinth[1]	----	----	----	2.48	.08	.02	.70	----	2.04	----	----	.06	.16	.38	----	.12	.52	.06	.26	.40	.02	1.02	----	.90	.24	.14	.80	----	----	1.44	.40	.30	12.54
Fulton	----	----	.27	----	----	.31	.58	1.25	1.08	----	----	.39	.46	----	----	----	.79	----	.49	----	.31	.48	----	----	1.30	.46	1.03	----	----	1.51	.08	.35	11.14
Greenville[1]	----	----	----	.59	.02	.03	1.20	.09	3.71	----	----	.84	.22	.03	----	.11	.29	.38	.58	.24	.02	.95	----	.26	.29	----	.86	.28	.01	.80	.24	2.55	14.59
Greenwood[1]	----	----	T	.83	.02	----	.89	.25	3.16	----	----	.86	.22	.04	----	.11	.40	.18	.64	.25	T	.48	----	.18	.53	.05	.52	T	----	1.30	.21	.64	11.76
Holly Springs[1]	----	----	----	1.39	.12	----	1.11	----	1.96	----	----	T	.14	.09	----	.17	.61	.17	.12	.52	.04	1.22	----	1.72	.42	.07	1.81	.33	.58	1.40	.42	1.22	15.63
Pontotoc	----	----	.50	.35	.25	.82	----	1.50	.50	----	----	----	.98	.03	T	.38	.46	.06	.60	.05	.85	----	.60	.75	.82	.95	.25	----	.65	.70	----	----	12.05
Swan Lake[1]	----	----	----	.61	T	----	1.08	.05	3.62	----	----	.51	.16	.18	----	.09	.28	.34	.33	.27	.06	1.04	----	.17	.25	----	.36	.02	.06	1.20	.17	1.52	12.37
Tupelo[1]	----	----	----	.52	.31	.01	.86	.01	3.50	----	----	.40	.10	.66	----	.01	.17	.62	.23	.45	----	.77	----	.40	.70	.30	1.39	.01	----	1.52	.06	.87	13.87
University	----	----	1.31	.30	.10	.80	.05	.87	1.93	----	----	.35	.08	----	T	.29	.53	.05	.39	.04	.03	.93	----	.35	.26	T	.41	----	.45	1.33	.57	.24	11.66
Water Valley	----	----	1.32	.63	T	.58	.53	.97	1.93	----	----	.61	.23	.07	T	.26	.57	.08	.59	.12	.08	1.10	----	.39	.32	.08	.37	----	T	.97	.58	.41	12.79
EASTERN ARKANSAS																																	
Arkadelphia[1]	----	----	.77	.04	----	.29	.35	----	1.77	----	----	----	.09	.50	.02	1.86	1.17	----	.06	.02	.05	.66	----	.42	1.15	----	.50	2.31	2.45	1.60	.06	.68	16.82
Arkansas City[1]	----	----	.02	.85	T	T	.88	.11	2.62	----	----	.36	.04	.31	T	.04	.98	.45	.54	.10	T	.86	----	.32	.31	.05	1.65	.23	.15	1.86	.54	1.13	14.40
Batesville[1]	.04	----	.61	.07	.05	.95	.60	.02	.55	----	----	----	.07	.83	.08	1.20	1.92	T	.15	.14	.17	1.50	----	.02	.22	----	.50	3.05	1.15	1.03	.01	1.09	16.02
Black Rock[1]	----	----	.16	.14	----	.59	1.20	----	1.40	----	----	----	.04	.56	T	1.12	1.80	----	.10	.12	1.00	1.35	----	.02	.23	----	.43	2.80	.96	.40	.02	.88	15.32
Blytheville[1]	----	----	.49	.21	.01	.11	T	----	.28	----	----	----	.01	.75	----	1.76	.80	----	.09	.19	.06	.32	----	.54	3.94	----	.35	4.50	3.51	.96	.94	.60	20.42
Calico Rock[1]	----	----	1.10	----	----	.90	.29	----	.44	----	----	----	.02	1.25	.05	.85	.65	----	.03	----	.96	.57	----	----	----	----	.21	.30	2.08	.45	T	.50	10.65
Camden[1]	----	----	1.25	.11	----	.37	.60	.10	2.00	----	----	.17	.24	.04	.13	.55	1.17	.25	.23	----	----	.20	----	.50	1.40	.02	.66	1.12	.95	1.22	.40	.34	14.02
Clarendon[1]	----	----	.55	.22	.01	.08	.79	----	.95	----	----	.09	.21	.07	.02	.60	.97	.10	.25	.11	.02	.21	----	.22	1.85	----	.90	1.87	2.70	1.05	.58	.91	15.33
Clinton	----	----	1.10	----	.96	.84	----	.75	----	----	----	.11	.26	.57	.23	1.62	----	T	.95	.35	.84	----	----	.02	----	.01	.83	1.72	1.35	.28	.64	----	13.43
Crossett (near)	----	----	.91	----	----	1.10	----	3.60	1.06	----	----	2.05	.10	----	.30	.15	.80	.28	.72	----	.48	1.03	----	.15	.11	.25	2.00	----	.20	.75	1.10	.10	17.24
Danville[1]	----	----	.98	.26	----	.32	.44	----	.78	----	----	----	.03	.80	.02	.56	1.48	----	.21	.12	.18	.36	----	----	----	----	.21	.24	2.44	1.04	.35	.48	11.30
Fordyce	----	----	.57	----	.32	1.00	----	3.50	----	----	----	.21	.09	.01	.16	.82	.86	.18	.13	.04	.11	.01	----	1.44	.74	.02	1.76	1.10	3.44	.20	.96	.01	17.68
Fort Smith[2]	T	1.29	.41	----	.13	.31	----	.43	T	----	----	----	.27	.48	.36	.26	----	T	.06	.01	.78	----	----	T	----	T	T	.74	.56	T	.32	----	6.41
Fulton[1]	----	----	.90	----	----	.33	.45	T	1.32	----	----	T	.03	.55	----	1.90	1.43	T	.05	T	.07	.85	----	.30	.70	----	.61	3.87	.71	.95	.12	.43	15.57
Georgetown[1]	----	----	.07	----	----	.15	1.30	----	.62	----	----	----	.03	.78	T	2.56	.50	----	T	.43	.06	1.25	----	.28	4.25	----	T	3.30	2.65	.75	1.00	.15	20.13
Helena[1]	----	----	.40	.43	----	----	1.85	----	1.80	----	----	.16	.42	.22	----	.18	1.71	.34	.57	.29	----	1.62	----	.88	.81	----	2.26	1.26	.67	.89	2.23	.70	19.69
Jonesboro[1]	----	----	.30	.19	.01	.47	.50	----	.58	----	----	----	.09	.88	.05	1.72	.89	----	.12	.35	.14	1.15	----	.10	2.30	----	.20	4.41	3.10	1.29	.27	.85	19.96
Little Rock[2]	T	----	.48	T	.31	.57	----	.79	----	----	----	.04	.81	.03	.83	1.59	.46	.04	.16	.04	1.00	----	.09	2.05	----	.11	3.60	3.49	1.89	T	.86	----	19.24
Marianna	----	----	.60	.01	----	1.60	----	.30	1.44	----	----	.10	.35	----	.17	.28	.55	.55	.25	----	.50	.05	----	2.13	----	----	.94	3.55	2.05	----	1.70	.10	17.22
Marked Tree[1]	----	----	.35	.26	.02	.76	----	----	.32	----	----	----	----	.79	.08	1.36	.76	----	.26	.17	.16	.54	----	.76	4.21	----	.25	3.86	3.99	.97	.96	.93	21.76
Newport[1]	----	----	.42	.10	.02	.59	.51	----	.67	----	----	----	.03	.62	.02	1.21	.21	----	.44	.22	.14	1.23	----	.03	1.52	----	.09	4.52	2.92	1.32	.01	1.10	17.94
Paragould[1]	----	----	.43	.30	1.26	.69	.41	----	----	.47	T	----	----	.54	----	1.49	1.75	.08	.07	.39	.11	1.27	----	----	1.33	----	.13	4.64	2.88	2.19	T	1.27	21.70
Parkin[1]	----	----	.55	.28	----	----	1.25	----	.43	----	----	----	T	.41	.08	1.00	.75	T	.15	.13	----	.30	----	.54	2.70	----	.75	2.85	3.35	.85	.96	.96	18.29
Pocahontas	----	----	1.03	----	.07	1.05	----	----	.53	----	----	----	.75	.06	.25	1.90	1.20	----	.10	.22	1.25	.10	----	.23	----	----	1.90	1.42	1.30	----	----	----	13.36
St. Charles[1]	----	----	.65	T	T	----	----	1.60	1.50	----	----	1.41	.32	T	T	1.00	.70	.20	.35	.10	.40	.20	.30	1.15	.40	T	1.65	2.20	2.00	.55	1.53	----	18.21
Searcy	----	----	.38	.09	.03	.43	.75	----	.70	----	----	----	.06	.69	.09	1.35	.96	.30	.08	.21	.09	1.23	----	.11	1.41	----	.15	4.83	2.29	1.49	.06	.79	18.57
Wilson[1]	----	----	.70	----	----	1.10	----	.60	.45	----	----	----	----	----	.35	.80	----	.20	.05	----	.55	----	----	1.90	2.20	----	.98	2.95	3.62	.95	1.10	.23	18.73
Wynne[1]	----	----	(3)	.52	----	T	1.05	----	(3)	----	----	----	(3)	1.10	.25	.85	.57	.01	----	.30	.35	.05	----	----	3.50	.45	3.30	3.50	1.00	.01	1.70	----	18.51
SOUTHEASTERN MISSOURI																																	
Annapolis	----	----	.43	----	----	1.98	----	----	.44	----	----	----	----	1.42	.40	.90	.25	----	----	.10	2.43	----	----	T	T	----	.29	1.40	1.28	----	.48	----	11.80
Arcadia[1]	----	----	.44	T	T	.87	.55	----	.49	----	----	----	T	1.37	.65	.90	.43	----	----	.02	1.01	1.40	----	----	.02	----	.14	.16	1.19	.56	----	.35	10.55
Belleview	----	T	----	----	----	1.60	----	----	.10	----	----	----	.60	1.30	.60	.50	.25	----	----	----	1.80	.30	----	----	----	----	.40	.30	.50	----	----	----	8.25
Bragg City[1]	----	----	.04	.35	.36	.10	1.40	----	.44	----	----	----	----	.90	.03	1.03	.80	----	.40	.38	.30	1.25	----	.11	1.75	----	.05	4.20	(3)	2.80	----	1.25	17.94
Campbell	----	----	1.04	----	----	1.50	----	----	.40	----	----	----	.70	----	.10	1.05	----	----	----	----	1.68	----	----	.65	.69	----	1.95	2.10	(3)	2.50	1.05	----	15.41
Cape Girardeau[1]	----	----	.69	.20	.03	.57	.49	----	.33	----	----	----	----	.73	.01	1.37	.28	----	----	----	1.81	2.02	----	.45	.05	----	.35	1.66	.81	.90	----	1.20	13.95
Caruthersville[1]	----	----	.10	.08	----	.08	1.21	----	.30	----	----	----	.04	.91	----	1.45	.75	----	----	.52	.12	.41	----	.26	2.50	----	.15	4.00	2.00	1.10	.65	----	16.63
Crystal City[1]	----	----	.28	----	.04	.82	.26	----	.34	----	----	----	----	1.73	.14	1.12	.26	----	----	T	.28	1.11	----	----	----	----	.41	----	.74	.20	----	.18	7.91
Farmington	----	----	.36	T	T	1.06	----	----	.45	----	----	----	.09	1.65	.42	.66	.21	----	----	.04	1.72	----	----	.04	----	----	.16	.90	.64	----	.34	----	8.74
Fisk[1]	----	T	.16	.11	.14	1.14	.56	----	----	----	----	----	----	1.11	.04	1.44	1.24	----	----	.04	.66	1.80	----	.11	.22	----	.39	2.19	1.23	1.14	.07	.87	14.66
Fredericktown[1]	----	----	.12	.20	----	.71	1.09	----	T	----	----	----	----	1.75	.40	1.05	.32	----	----	----	1.26	1.53	----	----	----	----	.16	.51	1.30	1.27	----	.61	12.28
Greenville	----	----	----	----	----	3.50	----	----	.74	----	----	----	.63	.56	.72	1.75	----	----	.11	.05	6.15	----	----	----	.04	----	.80	.82	2.23	T	.32	----	18.42
Jackson	----	----	.80	----	.05	2.71	----	----	.45	----	----	----	.18	.78	.17	1.65	.66	----	----	.13	5.43	----	----	.16	----	----	1.22	1.50	1.55	----	.85	----	18.29
Leeper[1]	----	----	.61	.03	T	.70	1.70	----	.43	----	----	----	T	1.69	.14	1.11	.58	----	----	.04	2.41	1.42	----	T	----	----	.12	.70	1.65	.66	.12	.33	14.44
Marble Hill	----	----	.55	----	----	1.95	----	----	.45	----	----	----	.12	.70	.18	1.50	.50	----	----	.10	5.45	----	----	.10	----	----	.80	1.10	1.40	----	.70	----	15.60
Morehouse	----	----	.84	----	.04	1.41	----	----	.37	----	----	----	.57	.22	.40	1.62	.96	T	T	.05	1.66	.20	----	.37	.87	----	2.02	2.41	1.82	.08	.33	----	15.84
New Madrid[1]	----	----	.14	.22	.05	.10	.89	----	.34	.01	----	----	----	.40	----	.70	1.37	----	----	.01	.55	.78	----	.21	.75	----	.12	3.25	2.10	1.92	.35	.60	14.86
Parma[1]	----	----	.70	.10	----	.48	.35	----	.45	----	----	----	----	.76	----	1.15	1.40	----	----	----	.47	1.35	----	.12	1.47	----	.10	3.60	2.95	1.17	.32	1.05	17.99
Poplar Bluff[1]	----	----	.85	----	.12	.82	----	----	.45	----	----	----	----	.93	.10	1.18	3.03	----	----	----	.75	1.16	----	T	.18	----	.35	1.70	1.15	.95	----	.82	14.54
St. Louis[2]	----	.01	.36	T	.12	.73	----	.26	.09	T	----	T	T	1.00	.94	.28	----	T	T	.14	1.14	----	----	.02	----	----	.13	.52	.19	----	.26	----	6.19
Sikeston	----	----	.82	----	.35	.44	----	----	.44	----	----	----	----	.75	----	.85	.30	----	----	----	.90	1.40	----	----	1.30	----	.15	3.90	----	3.20	.40	.55	15.75
Union[1]	----	T	.68	.10	T	.22	.35	----	.34	----	----	----	----	.65	.85	.73	.19	----	----	.01	.10	1.18	----	----	T	----	.20	----	.43	.32	----	.19	6.54
Williamsville	----	----	.80	----	.03	1.10	1.11	----	.41	----	----	----	----	1.10	.10	1.21	1.00	----	----	.04	3.52	1.75	----	.07	----	----	.17	.98	1.33	1.24	----	.85	16.81

[1] Precipitation for 24 hours ending in the morning.
[2] Precipitation for 24 hours ending at midnight.
[3] Included in the next following measurement.

Snow cover.—Snow played no important part in the 1937 flood. Before the rain period began on December 25 there was a light snow mantle over the northern half of the Ohio Basin. However, owing to the occurrence of rain and mild temperatures, the southern limit of the snow cover receded to the northern Lake Region by the 28th. The snow that fell subsequently was quickly melted by the general rains and had no appreciable effect on the flood. (See fig. 4.)

FIGURE 4.—Depth of snow on ground, 8 p. m., January 4, 1937.

MAJOR STORM PERIOD, DECEMBER 25–JANUARY 25

All of the precipitation that had any direct bearing on the flood occurred within the period December 25, 1936, to January 25, 1937. Figure 11 shows the accumulated depth of precipitation over the Ohio Basin for this period. In the preparation of this and other isohyetal maps precipitation records were plotted for about 600 observation stations reporting to the Weather Bureau. The daily and total amounts of precipitation are presented in table 7.

Geological Survey Water-Supply Paper 838—Floods of Ohio and Mississippi Rivers, January–February 1937—which is being prepared contemporaneously with this report, will present a comprehensive compilation of data, including rates of discharge, volume of run-off, and other selected information concerning the hydrologic conditions associated with the 1937 floods. That report will include a compilation of records of precipitation during the storm period for approximately 400 observation stations other than those maintained by the Weather Bureau. The main sources of such records are the Tennessee Valley Authority, the Muskingum Watershed Conservancy District, and the Soil Conservation Service and the Bureau of Agricultural Engineering, of the United States Department of Agriculture. These records are supplementary to the ones compiled in this report and may be referred to in connection with investigations in which a more detailed consideration of precipitation is desirable.

Figure 11 shows that practically all of the excessive precipitation between December 25 and January 25 occurred within the Ohio Basin, with the exception of one area over the northern portion of the lower Mississippi River, one just outside the basin in extreme northwestern South Carolina, and another in the vicinity of Meridian, Miss., which is not shown on the map. The area of greatest rainfall (20 inches or more) extends from northeastern Arkansas to a point just south of Louisville, Ky. The heaviest amount recorded in this area (25.11 inches) was at Johnsonville, Tenn., on the Tennessee River, a short distance south of the Kentucky border.

Little precipitation occurred after January 25, so that figure 10, which shows the total for the whole month, very nearly represents the rainfall during the first 25 days. Figure 12 shows the January precipitation as a percentage of the normal for the month. An area of about 24,000 square miles, in the Ohio Basin, had rainfall amounting to 400 percent or more of the normal.

In table 8 the average precipitation for January is given for the States and sections of those States lying within the Ohio Basin or adjacent to it. For the States listed in the table, all records for January were broken as follows: Extreme southern Illinois, Indiana, Ohio, Pennsylvania, West Virginia, Virginia, Kentucky, Tennessee, Arkansas, and southeastern Missouri. The record for all months was broken in Indiana, Ohio, Kentucky, and Tennessee. In Kentucky the previous all-time record was broken by more than 4 inches; in Tennessee, by more than 3 inches, and in Ohio and Indiana, by more than 1 inch. The former monthly record of 18.67 inches at Dresden, Tenn., was exceeded at 12 stations in Tennessee; the greatest amount was 23.90 inches at McKenzie, Tenn. The greatest amount reported in 24 hours within the Ohio Basin was 5.52 inches at Martin, Tenn., on January 21.

TABLE 8.—*Summary of January rainfall over Ohio Basin and comparison with previous records*

Area	Drainage	January 1937 rainfall	Departure from normal	Previous highest and date— For January	Previous highest and date— For any month
Illinois:					
State	Mostly Ohio and Mississippi.	5.98	+3.64	6.98 1916	9.43 Sept. 1926
Northern	Mostly Mississippi	3.04	+1.42	4.77 1916	9.51 June 1902
Central	Ohio and Mississippi	4.94	+2.75	6.92 1916	12.07 Sept. 1926
Southern	do	11.74	+8.18	9.26 1916	11.34 Oct. 1919
Brookport	Ohio	19.03			
Indiana:					
State	Mostly Ohio and Mississippi.	9.93	+6.76	7.75 1913	8.89 Mar. 1913
Northern	do	4.27	+1.84	5.72 1890	9.95 May 1892
Central	Ohio	9.31	+6.24	7.79 1890	11.28 Sept. 1926
Southern	do	16.22	+12.20	10.43 1913	10.46 Oct. 1919
Evans Landing	do	21.39	+16.90		
Ohio:					
State	Ohio and Lake Erie	9.42	+6.31	7.01 1913	8.40 Mar. 1913
Northern	do	7.24	+4.53	6.41 1913	9.23 Mar. 1913
Central	Ohio	10.22	+7.06	7.27 1913	9.46 July 1896
Southern	do	12.27	+8.69	7.95 1913	8.22 May 1933
Fernbank	do	14.88			
Pennsylvania:					
State	Ohio and Atlantic	6.36	+3.08	5.56 1915	8.88 May 1894
Ohio Drainage	Ohio	8.05	+4.73		
Lycippus	do	10.54	+6.41		
West Virginia:					
State	Ohio and Atlantic	8.50	+4.77	6.41 1907	9.07 July 1896
Northern	Ohio	9.25	+5.22	7.75 1907	[1]12.98 July 1896
Southern	do	8.55	+4.85	5.93 1907	7.90 Mar. 1917
Huntington	do	12.07	+8.28		
Virginia:					
State	Ohio and Atlantic	8.01	+4.67	6.45 1936	9.51 Aug. 1906
Ohio Drainage	Ohio	7.04	+3.85		
Pennington Gap	do	12.34			
Kentucky:					
State	do	15.77	+11.20	11.41 1913	11.41 Jan. 1913
Eastern	do	12.22	+8.51		
Central	do	17.54	+13.16		
Western	do	18.77	+14.19		
Earlington	do	22.97	+17.93		
Tennessee:					
State	Ohio and Mississippi	14.74	+9.83	9.64 1913	11.27 Mar. 1897
Eastern	Ohio	11.02	+6.57		
Central	do	15.97	+10.85		
Western	Ohio and Mississippi	18.47	+12.64		
McKenzie	Mississippi	23.90			
Arkansas: State	do	12.61	+8.22	9.67 1932	18.52 Apr. 1928
Missouri:					
State	Missouri and Mississippi.	6.38	+3.99	7.66 1916	11.25 June 1928
Southeastern	Mississippi	10.28	+6.87	9.42 1916	14.12 June 1928
Parma	do	16.61			
Entire Ohio Basin		[2]11.20			

[1] Approximate.
[2] January 1-25.

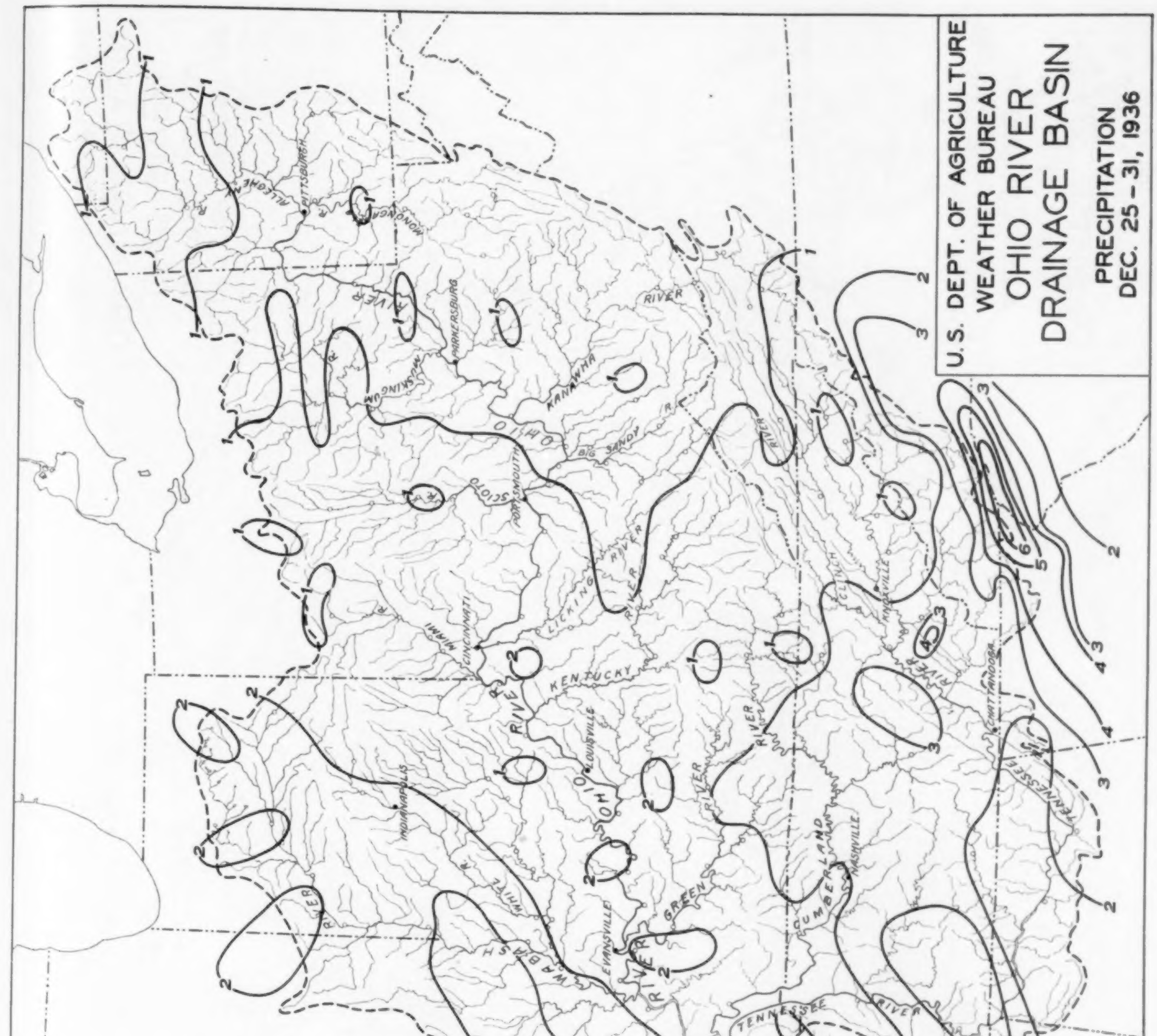

FIGURE 5.—Precipitation, December 25-31, 1936, inclusive.

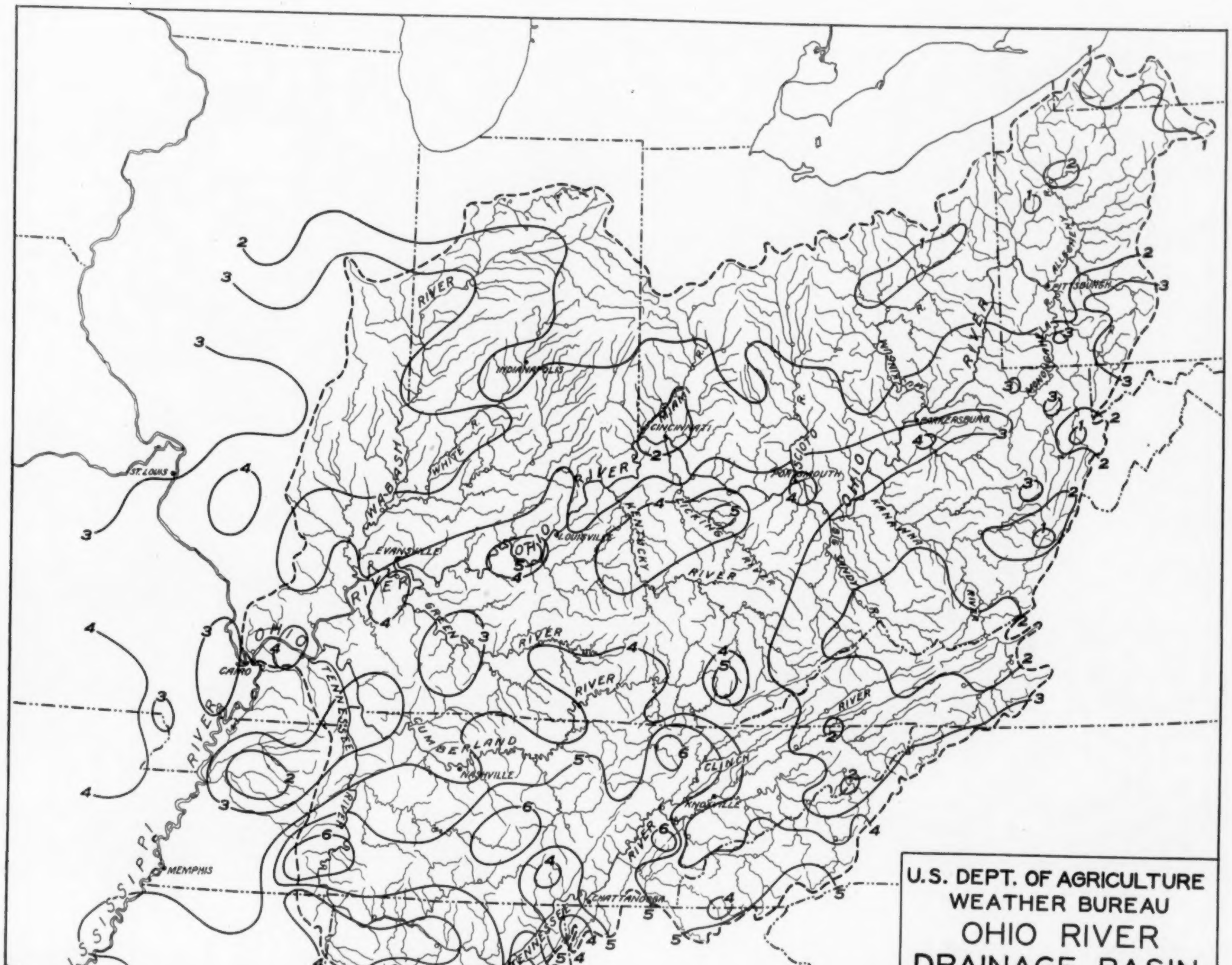

FIGURE 6.—Precipitation, January 1-12, 1937, inclusive.

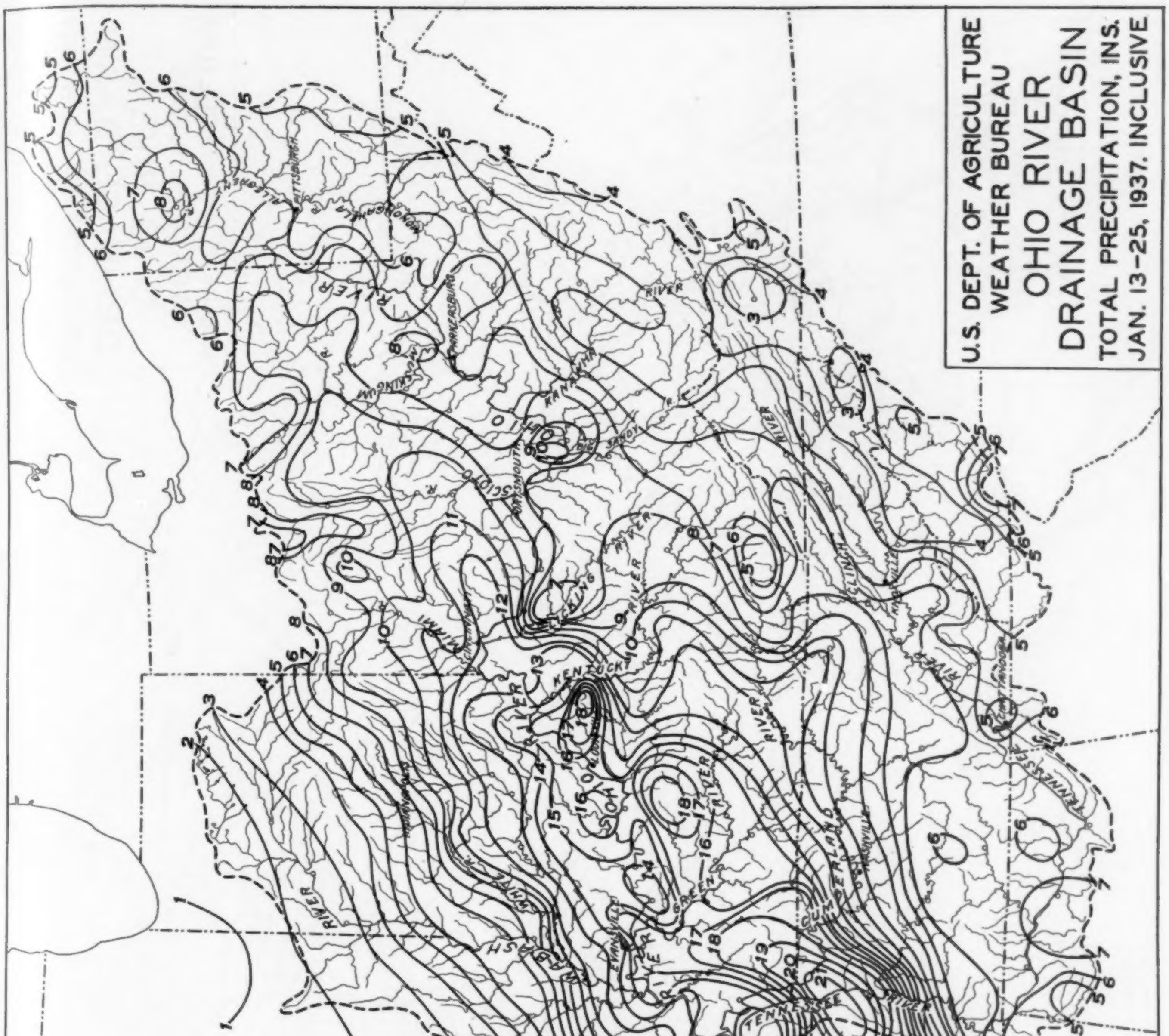

FIGURE 7.—Precipitation, January 13-25, 1937, inclusive.

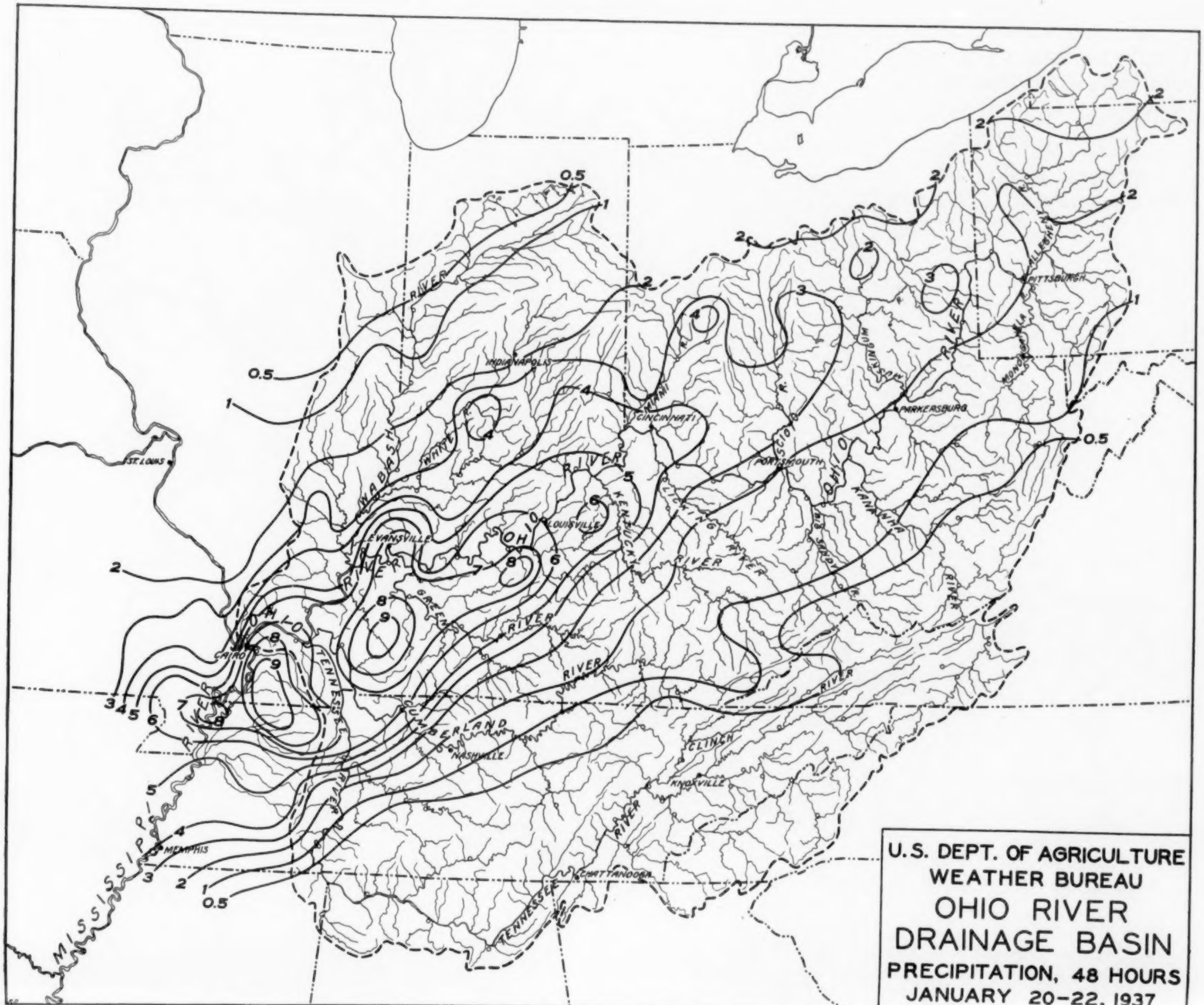

FIGURE 8.—Precipitation (48 hours), January 20-22, 1937.

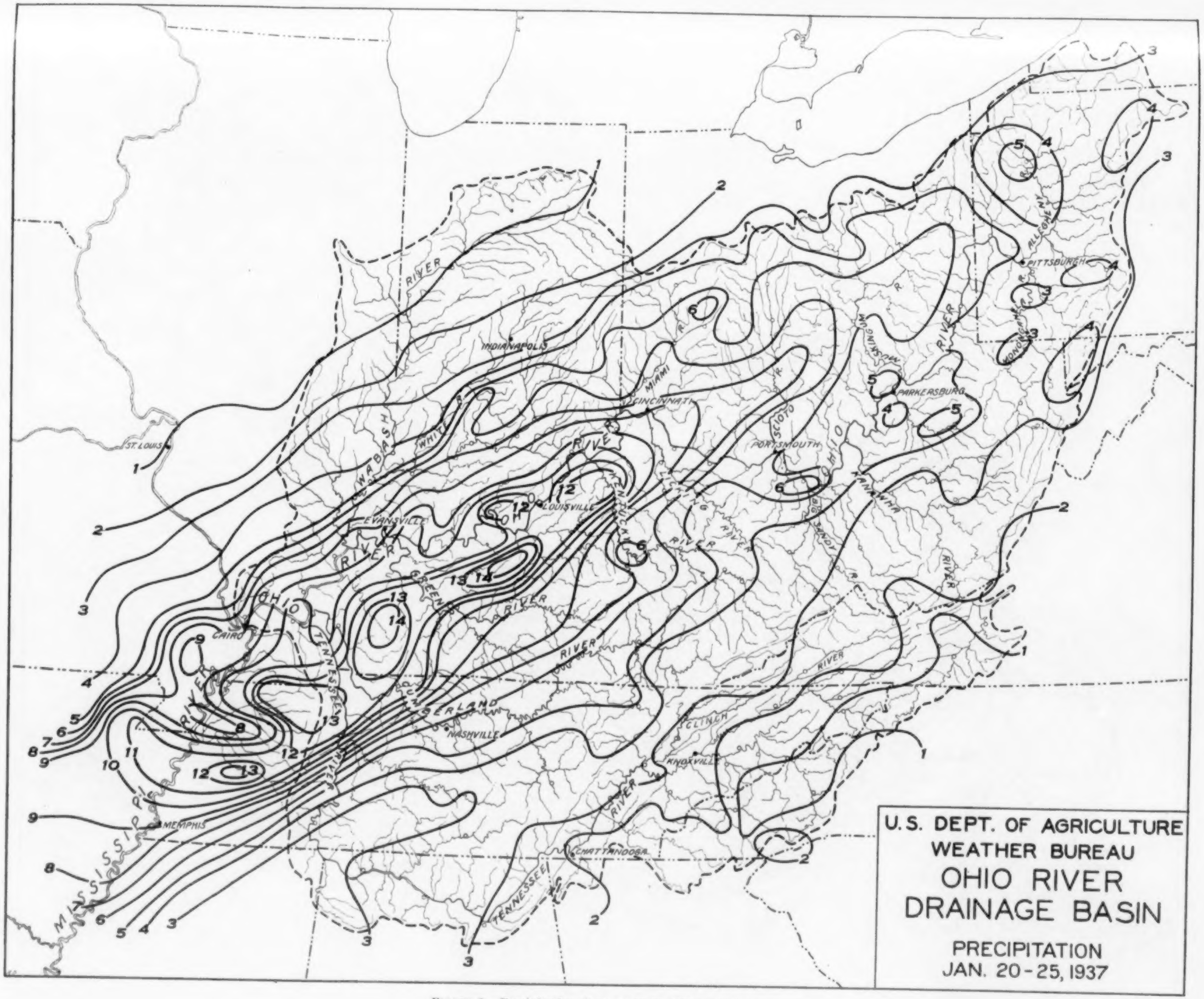

FIGURE 9.—Precipitation, January 20-25, 1937, inclusive.

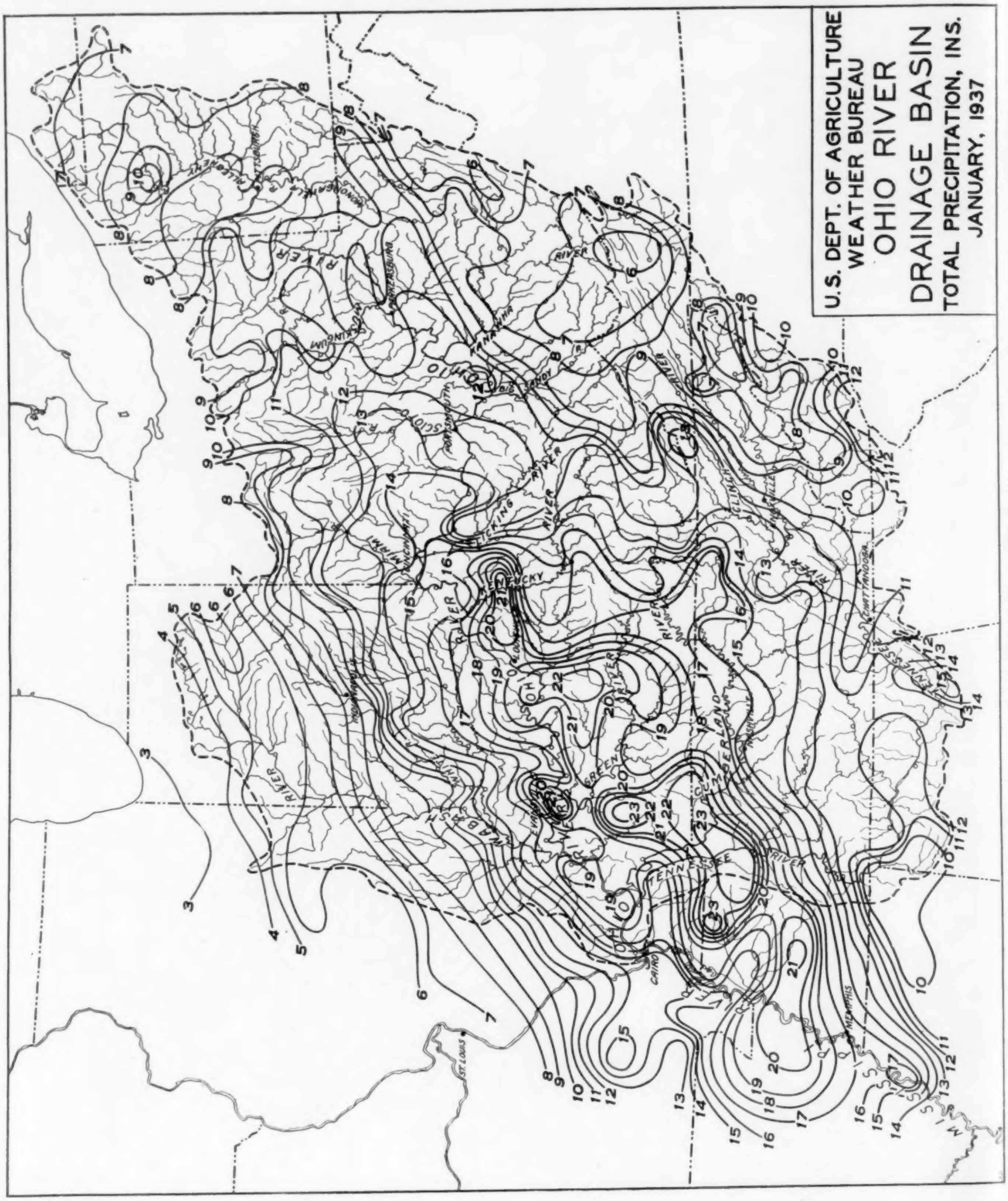

FIGURE 10.—Precipitation for January 1937.

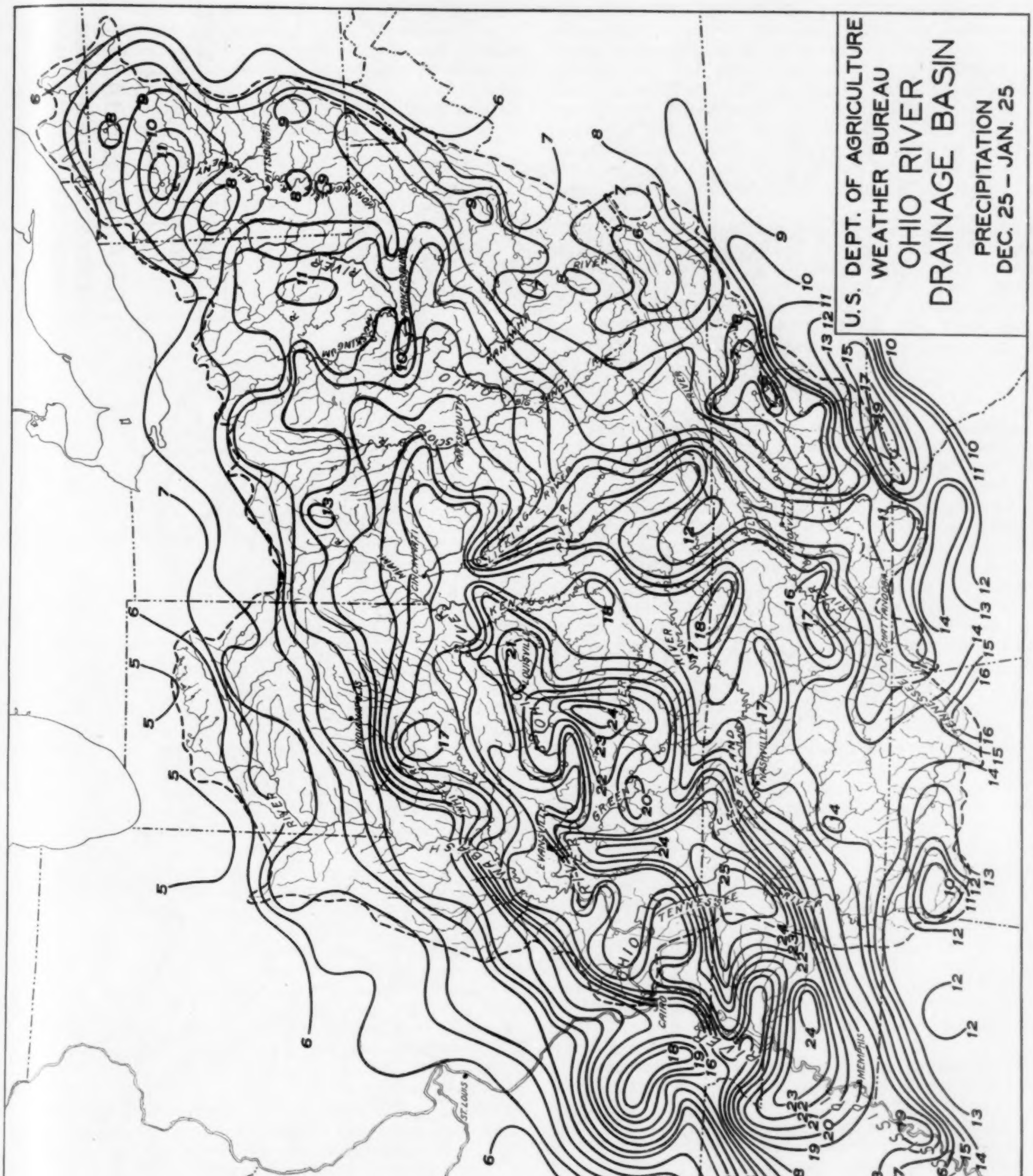

FIGURE 11.—Precipitation, December 25, 1936, to January 25, 1937, inclusive.

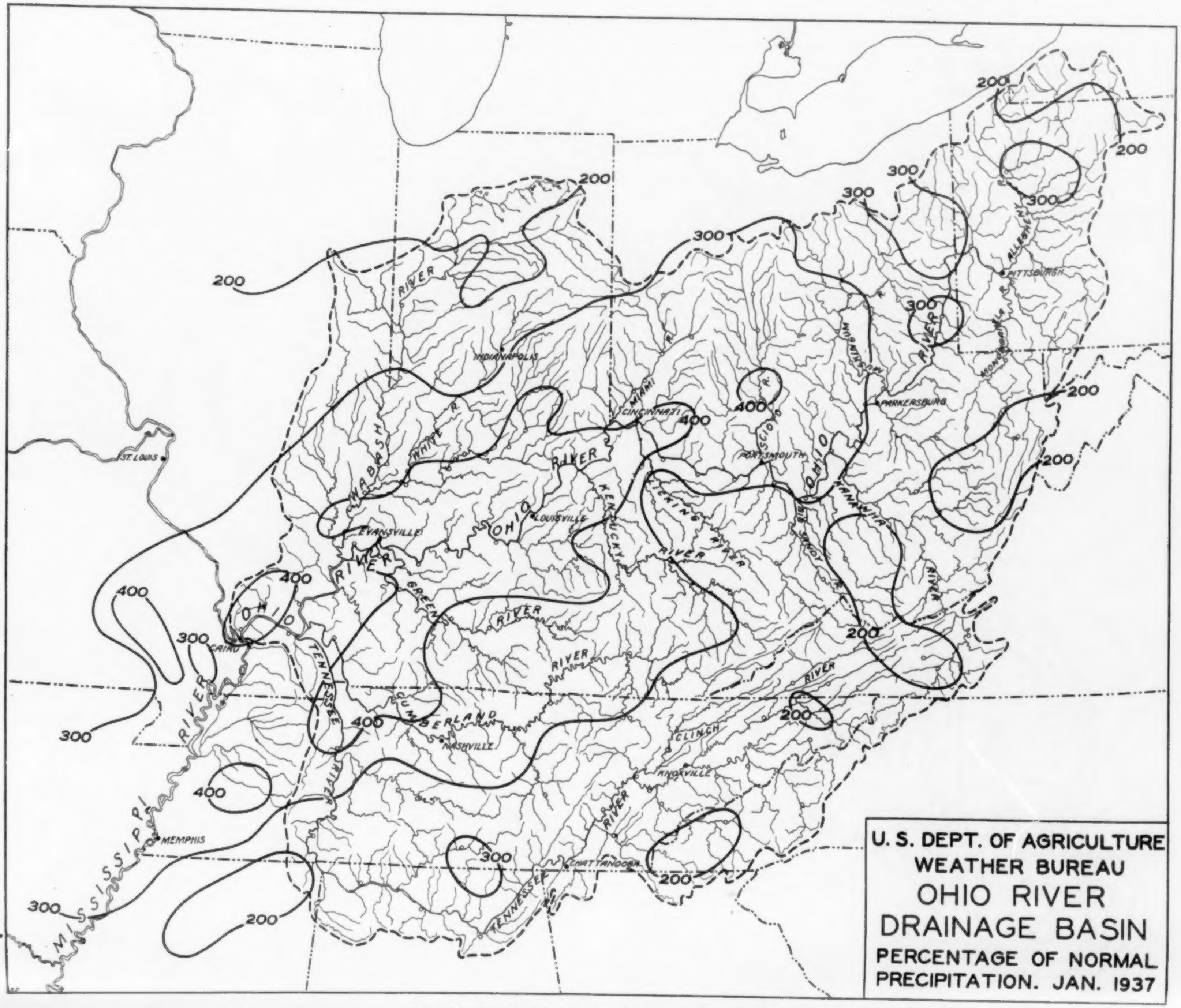

FIGURE 12.—Percentage of normal precipitation for January 1937.

The weighted average depth of accumulated precipitation between January 1–25 over the entire Ohio Basin as well as over each of the principal subbasins is presented in table 9. The average depth over the entire Ohio Valley is 11.20 inches, a total of 2,284,708 mile-inches of water. The greatest subbasin depth is in the small Tradewater River Basin, with 20.38 inches, closely followed by the Green and Salt River Basins, all in Kentucky, with 18.41 and 17.87 inches, respectively. The least rainfall, 6.38 inches, is in the Allegheny Basin.

TABLE 9.—*Total precipitation, Jan. 1–25, 1937, inclusive, Ohio River Basin*

[1-inch isohyetals drawn on maps, scale 1:500,000, and areas planimetered]

Basin	Area in square miles	Precipitation in mile-inches	Precipitation weighted average
Allegheny	11, 731	74, 923	6. 38
Monongahela	7, 370	60, 108	8. 16
Beaver	3, 127	24, 237	7. 75
Muskingum	8, 038	77, 367	9. 62
Little Kanawha	2, 283	22, 090	9. 67
Hocking	1, 200	13, 405	11. 17
Kanawha	12, 301	83, 760	6. 81
Guyandot	1, 698	13, 074	7. 70
Twelvepole Creek	458	4, 538	9. 91
Big Sandy	4, 275	35, 432	8. 29
Scioto	6, 510	74, 494	11. 44
Little Miami	1, 755	23, 315	13. 28
Licking	3, 635	45, 703	12. 57
Miami	5, 385	60, 976	11. 32
Kentucky	6, 921	92, 402	13. 35
Salt	2, 801	50, 029	17. 87
Green	9, 197	169, 345	18. 41
Wabash	32, 727	303, 781	9. 28
Saline	1, 190	17, 700	14. 87
Tradewater	1, 001	20, 583	20. 38
Cumberland	17, 880	267, 376	14. 95
Tennessee	40, 667	449, 569	11. 05
Miscellaneous [1]	21, 796	300, 501	13. 79
Ohio, entire basin	203, 946	2, 284, 708	11. 20

[1] Including direct drainage into the Ohio River and minor tributaries not listed above.

The daily precipitation during the entire period has been computed as average depth for each subbasin. This was obtained by plotting daily precipitation for about 275 stations at which rainfall is measured in the morning. The average precipitation for the subbasins was obtained by using the arithmetic means of these stations. For several days, on which inconsequential amounts occurred, no computations were made. Figures 13 and 14 show the average daily rainfall depth over each subbasin and the stage hydrograph for the most downstream river gaging station in each particular subbasin.

In practically all of the subbasins, except the Cumberland and Tennessee, the hydrographs show several minor rises during the first half of the flood period, with the principal rise occurring during the latter half. Although the rises in the first half were quite well defined, rains beginning about January 14 were so closely grouped as to make it difficult to distinguish rises resulting from individual storms after that date. There were two principal rises on the Cumberland and Tennessee Rivers, the first as the result of the rains on the last few days of December and the first 2 days of January, and the second as a result of the closely grouped downpours beginning about January 10 or 11. Except for the upper Tennessee, the rise during the latter half was the greatest in all subbasins of the Ohio. This is illustrated by comparing the hydrograph at Bridgeport, Ala., with other hydrographs shown in figures 13 and 14.

The entire rainfall period has been divided into three subperiods and the isohyetal maps (figs. 5–7) show the total precipitation for each period. This division of the storm period conforms to the three separate phases of the flood. The first represents the actual beginning of the flood, with heavy rains falling principally over the watersheds of the three largest tributaries of the Ohio River (the Wabash, Cumberland, and Tennessee) at a time when they, as well as the Ohio proper, were at low stage. These rains resulted in sharp rises on the lower Ohio and tributaries. The rains of the second storm period caused the gradual filling of the lower Ohio River storage so that by the end of this period the river was above flood stage from the mouth to Evansville. The final period was comprised of a series of heavy, and almost continuous, rains centered almost directly over the Ohio Valley and these rains were the immediate cause of the record-breaking flood to follow.

Precipitation, December 25–31.—Two principal storms occurred during this period, one on the 27–28th and the other on 30th–31st. Some precipitation occurred on the 25th and 26th, but only over the extreme northwest portion of the basin. In the first storm the heaviest rain, averaging about 0.9 inch, fell over the Tennessee and Cumberland Basins. During the second storm the rainfall in the Cumberland and Tennessee averaged slightly over 1 inch, while in the Wabash and White Basins it averaged between 1.50 and 1.75 inches.

Precipitation, January 1–12.—During this period two storms took place—one on the 1st and 2d, the other on the 6–10th. In the first storm exceptionally heavy downpours occurred south of the Ohio River. More than 4 inches of rain fell in portions of the Tennessee and Cumberland Basins with an average depth of approximately 2.50 inches. Other basins receiving an average of more than 1 inch were the Kentucky, Big Sandy, and Kanawha.

The heaviest rains in the second storm were centered over the northern and central portions of the Ohio Basin, and practically all of the subbasins received over an inch of precipitation. At the end of the period the Licking, Green, and Wabash Rivers were in flood, as well as the lower Ohio from the mouth to Evansville.

Precipitation, January 13–25.—During the third and final phase of the storm period, January 13–25 (see fig. 7), rainfall was excessive and almost continuous in much of the Ohio Basin. A zone about 700 miles long and 100 to 200 miles wide, extending from Arkansas northeastward to south-central Ohio, received 10 inches or more of precipitation. From Cincinnati to Louisville the axis of the zone closely followed the Ohio River, and from Louisville to the mouth it lay a short distance to the south. The area of greatest precipitation was centered over the lower Tennessee just south of the Kentucky-Tennessee border. The greatest amounts recorded during the period were 21.2 inches at Dover, Tenn., and 20.6 inches at McKenzie, Tenn. The intensity and amount of rainfall decreased rapidly as the northern and southern boundaries of the Ohio Basin were approached. At Ashwood, Tenn., only about 75 miles southeast of Dover, as little as 5.9 inches were recorded.

There were three well defined rainfall periods in the final phase of this storm, and a notable feature is that only on the 16th, 19th, and a portion of the 23d was the rainfall not excessive over the Ohio River and the lower portions of its tributary streams. Run-off from these excessive rains produced heavy tributary discharge throughout the greater length of the Ohio River, which was already above flood stage in the lower portion and bankful or nearly full in the upper portion, and resulted in the unusually high stages in all but the extreme upper reach.

In the first storm, 13–14th, rain fell north of the Ohio River on the 13th and then slowly spread southward on

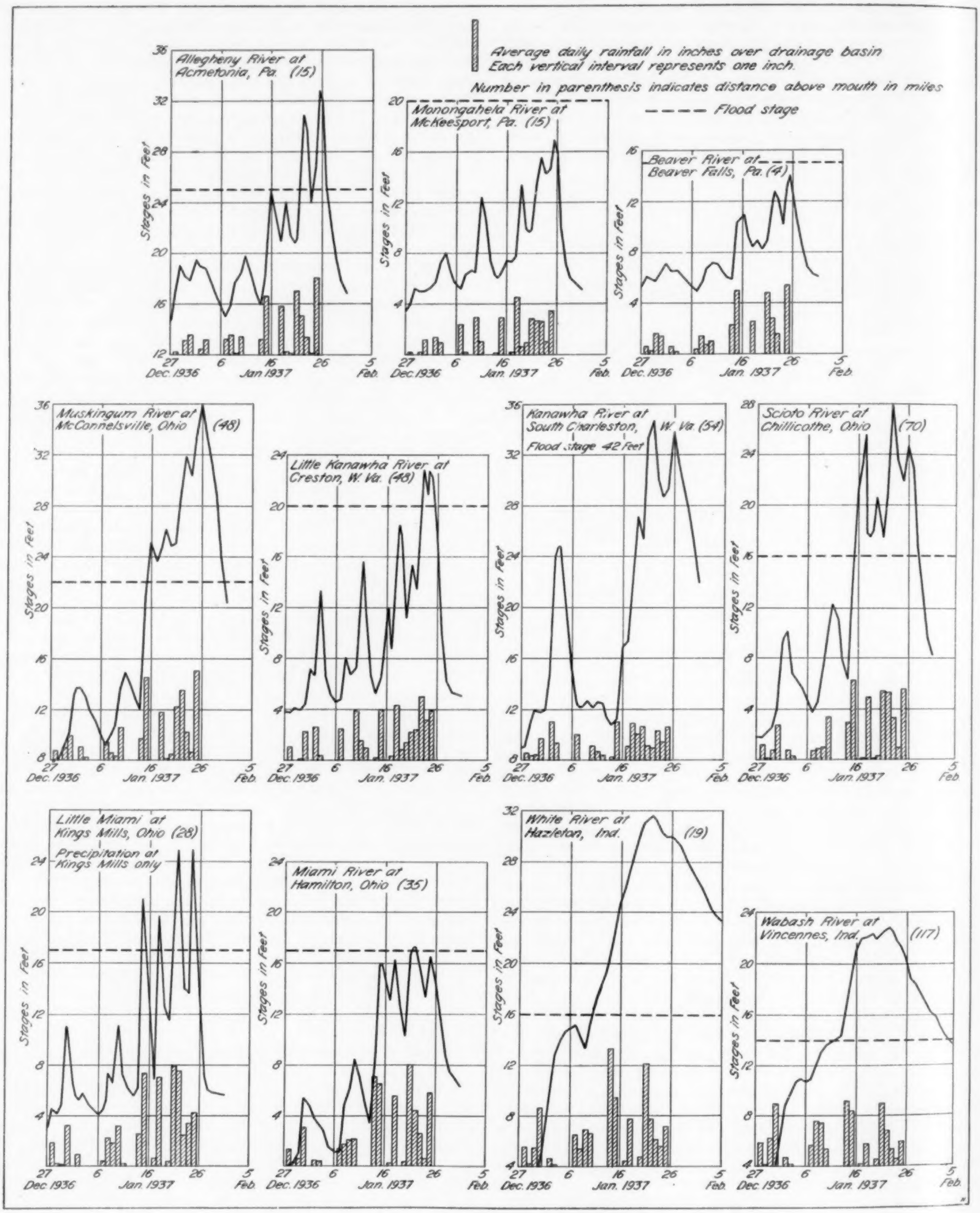

FIGURE 13.—Average daily precipitation and stage hydrographs for subbasins of Ohio River drainage.

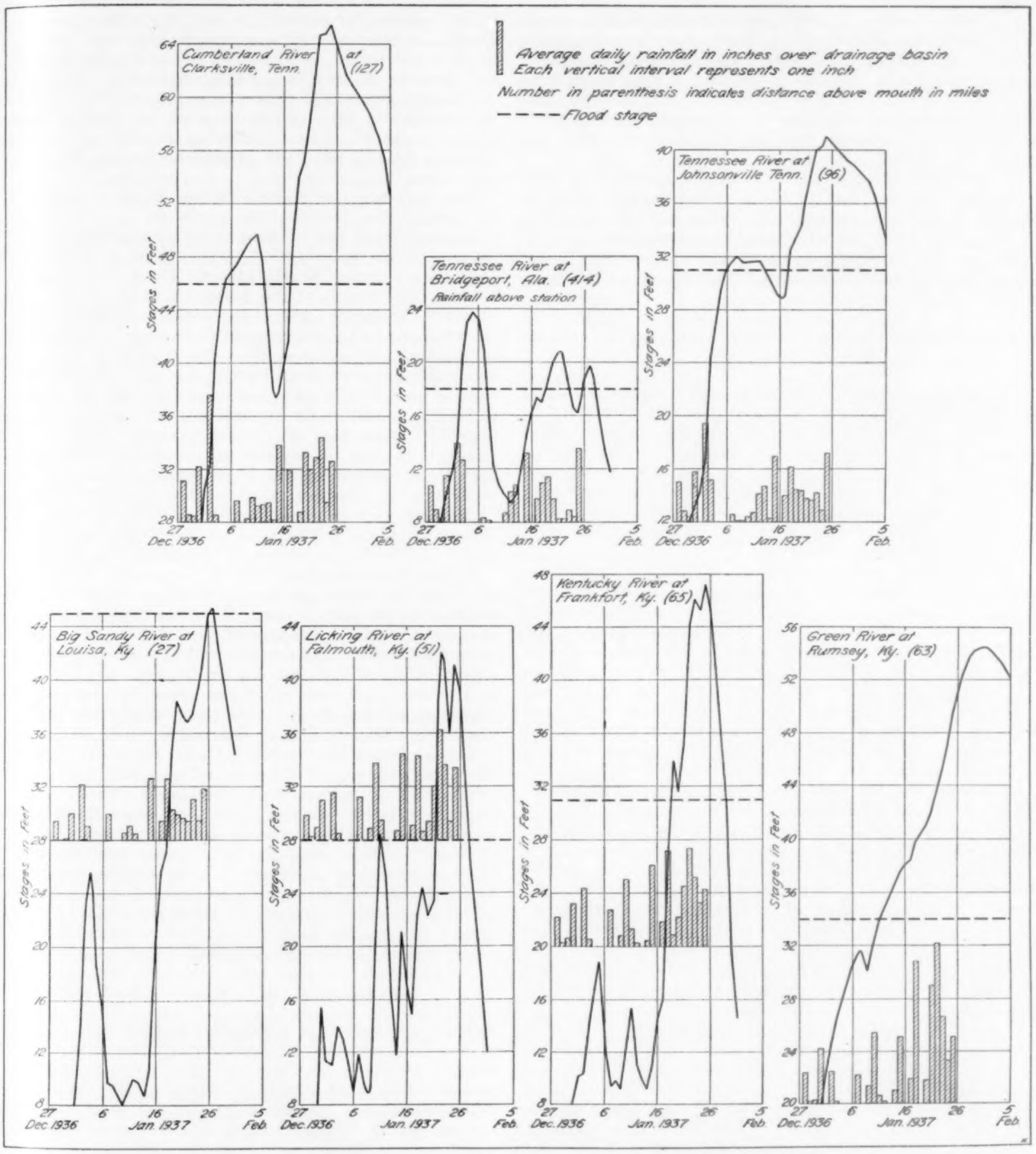

FIGURE 14.—Average daily precipitation and stage hydrographs for subbasins of Ohio River drainage.

the 14th. The heaviest amounts were recorded over the White and Miami Basins, with an average of more than 3 inches, and over the Wabash Basin, with more than 2 inches.

The second storm, 17–18th, was centered slightly south of the lower and middle Ohio River, then moved to the extreme southeastern portion of the basin on the 19th. Average rainfall in this storm exceeded 1 inch in all subbasins with the exception of the Beaver, Muskingum, and Wabash (excluding the White). Greatest amounts were recorded in the Green and the Cumberland, with an average of 3 inches.

In the third storm, 20–25th, excessive rainfall occurred every day, and the heaviest daily amounts recorded were located almost exactly over the lower half of the Ohio proper. The total rainfall during this period is shown in figure 9. The subbasin averages are as follows: Green, about 9.5 inches, and Kentucky, Cumberland, and Licking about 6.5 inches.

FACTORS CONTRIBUTING TO THE PROPAGATION OF FLOODS IN THE OHIO RIVER

The primary reason for frequent and extended floods in the Ohio Basin is given by Henry [4] as the "accident of geographic location with respect to the meteorological conditions which dominate the weather of the interior of the continent." Its location is such that practically all of its area lies within a belt of frequent and prolonged periods of copious rains which, particularly in the winter and spring, extends from Texas to New England directly over the longer axis of the basin.

Condensation occurs whenever humid air undergoes cooling sufficient to effect a reduction of its temperature to the dew point, i. e., the temperature at which the water vapor, mixed with the air, can no longer all exist in the vapor state and some of it appears in the form of clouds. Continued cooling of the air usually results in precipitation.

A cooling such as this may be brought about by a lifting of the air, which causes it to expand because of the decrease in pressure with the increase in elevation; as the air expands, it performs work, thereby transforming a portion of its heat into mechanical energy.

Lifting of the air may be caused by (1) changes in elevation of the land surface; (2) displacement upward over a colder, denser air mass; (3) insolational heating, causing instability and convection, and (4) convergence.

Flood-producing rains over the Ohio Basin are caused almost entirely by (2) the physical interaction between air masses. Two air masses of contrasting temperature do not readily mix, but, when they meet, must pass one over the other. The air of the colder mass, because of its greater density, is continually seeking a lower level, thereby displacing the lighter air of the warmer mass, which in turn is forced to rise over the colder air.

The line of contact between two contrasting air masses is called the line of discontinuity, or "front." When the warm air mass is advancing over territory formerly occupied by the colder air, the line of discontinuity is called a "warm front," and when the cold air mass is the aggressor, it is termed a "cold front." The line of discontinuity, or "front," is never vertical. A cross-section of the zone of frontal action between the air masses shows that the air of the colder mass assumes the form of a wedge, sloping upward and away from its points of surface contact with the warmer air. The slope of the upper surface of the cold air mass is usually about 1 or 2 percent and it is along this slope that the warm air is lifted.

It is at or near this line of contact between air masses that the greatest amount of precipitation over the Ohio Basin occurs, particularly during the winter and spring months, when the cold air masses are more developed, causing greater physical action to take place because of the greater differences in temperature. Normally the air masses move in a general west-to-east direction over the continent, with the boundaries, or lines of contact between the air masses, moving in the same general direction and causing the rainfall to be distributed over wide areas.

The movement of the air masses depends basically on the general circulation of the atmosphere, and changes in their movement are influenced to a great extent by the changes in the magnitude and distribution of barometric pressure over the North Atlantic Ocean, thus affecting largely the climate of the eastern portion of the United States.[5] Normally, during the winter and spring months, an area of semipermanent, high barometric pressure, or anticyclone, is centered over the region of the Azores. With this pressure distribution the atmospheric circulation is such that large quantities of warm, moist TA (Tropical Atlantic) air are transported from the Sargasso and Caribbean Seas northward over the western North Atlantic Ocean. Cold, dry Pc (Polar Continental) air masses, accompanied by high pressure, moving southward and southeastward from the northern region of North America over the eastern portion of the United States, will usually interact with the TA air in the vicinity of the Gulf of Mexico or over the Atlantic Ocean.

It sometimes happens that, with an increase in pressure at Bermuda, through the intensification or change in position of the Azores HIGH, there is a corresponding shift westward of the trajectories of the air masses. As long as this pressure distribution persists there is a steady stream of TA air into eastern United States. This stream is directed northward over the lower Mississippi Valley and then northeastward over the Ohio Valley, following the clockwise circulation associated with anticyclones.

The eastward movement of Pc air masses is blocked by the steady stream of TA air; and the line of contact between the air masses over the longer axis of the Ohio Basin oscillates, moving slightly southward and northward, depending upon the relative intensities of the high pressure accompanying the Pc air mass and the pressure in the vicinity of Bermuda. This relatively stationary discontinuity causes great quantities of precipitation to be released within a relatively small area instead of being spread out evenly over the continent, as would be the case in normally-moving circulation systems.

METEOROLOGY OF JANUARY 1937 STORMS

The distribution of pressure was abnormal over most of the Northern Hemisphere during the period December 21, 1936, to January 25, 1937, with an increase in pressure and a westward extension of the Azores HIGH. This distribution, insofar as it affected the weather conditions of the United States, is illustrated in figure 15, which shows the normal January sea-level pressure and the average during January 1937 over North America and adjacent waters.[6]

[4] Bulletin Z, Weather Bureau, 1913, previously cited, p. 3.

[5] W. J. Humphreys. Why Some Winters are Warm and Others Cold in the Eastern United States. MONTHLY WEATHER REVIEW, vol. 42, 1914, pp. 672–675 and charts.

[6] Weather on the Atlantic and Pacific Oceans, MONTHLY WEATHER REVIEW, vol. 65, January 1937, pp. 32–34.

The positive departure from normal pressure in the region of Bermuda is quite pronounced. The average at Bermuda during January 1937, using a. m. observations only, was 30.31 inches, or a departure of 0.15 inch above normal. Considering the period as from December 25 to January 24, inclusive, the average at Bermuda was 30.37 inches, or 0.21 inch above normal.

Even more remarkable was the abnormal pressure distribution over the northeastern North Pacific Ocean, where a sharp increase in intensity and a marked shift to the north and northwestward of the center of the area of average high pressure occurred. This center, with average pressure of about 30.50 inches, displaced the Aleutian LOW to a position a considerable distance west of its normal location.

The departures from normal pressure in this case consequently were unusually large. The greatest departure, +0.65 inch, occurred at Kodiak, Alaska. At Dutch Harbor, Alaska, in the vicinity of the usually strongly intrenched Aleutian LOW, the average pressure of 30.15 inches was the highest of record for January since 1916. In the southern portion of the high pressure area the departure was small, but generally negative. Under normal conditions the January pressure at Dutch Harbor is 0.45 inch lower than at Midway Island, which is in the border of the January high-pressure belt. However, during January 1937, a marked reversal occurred, with an average pressure at Dutch Harbor 0.20 inch higher than at Midway Island.

The most unusual pressure feature over the United States was the increase in the gradient from north to south over the Rocky Mountain and Plateau regions. The highest average pressure, 30.25 inches, was centered over Montana. The average pressure over the Southwest was lower than normal, with an average of less than 30.00 inches extending northward to northern Colorado. Over the remainder of the country the average pressure was very nearly normal, except east of the Appalachian Mountains where there was an increase in pressure.

Weather conditions resulting from this abnormal distribution of pressure were correspondingly abnormal over large areas. In southeastern United States northwesterly or westerly winds normally prevail in winter as a result of the gradient between the high pressure over the cold continent and the low pressure over the warm Gulf Stream and southern waters. However, with the expansion and westward extension of the Atlantic HIGH, such as occurred in January 1937, a steep pressure gradient, producing southerly winds, prevailed over the eastern Gulf of Mexico. (See fig. 15.) This resulted in a continuous inflow of moist TA air over southeastern United States, extending as far west as the Mississippi River. Abnormally high temperatures prevailed over this area, with the western boundary sharply defined, as shown in figure 16.

At the same time, the position of the Pacific HIGH over the northeastern Pacific, displacing the Aleutian LOW to the west, resulted in a marked change in the trajectory of the air masses affecting the western United States. The intensity and location of the Pacific HIGH during January resulted in a constant transfer to the southward of polar air masses originating over northern Alaska. The polar air masses covered practically all of that portion of the country west of the Mississippi River, including portions of the North Central States, and resulted in extremely low temperatures over that region.

The great contrast between temperatures in the eastern and western portions of the United States is seen in the fact that vegetation in the Southeastern States near the end of January had advanced, in many cases, a month ahead of normal. Early fruit trees had begun to bloom as far north as southern South Carolina. Severe freezes occurred in the Pacific Coast States and were especially damaging to citrus fruits and truck in southern California. The mean temperature for California during January was 4.8° lower than the previous coldest January of record, in 1917.

A heavy snow mantle covered the North Central States (see fig. 4) and served to maintain the stability of the polar air masses as they advanced to meet the warm air masses moving northward over the Ohio Valley. Thus, a line of contact was established between two air masses of greatly contrasting temperatures over the Ohio Basin. The northward flow of tropical air at the surface was forced aloft as the "front" was encountered. As the moist TA air rose over the polar air mass, the heaviest precipitation occurred some distance beyond, or northwest, of the surface front, extending sometimes as much as 100 to 300 miles. The surface front was usually situated south of the Ohio River, and for this reason most of the moisture was precipitated over the Ohio watershed.

Precipitation did not occur everywhere simultaneously along the front, nor was it of equal intensity at all points. The idea of a single storm center moving across the country must also give way here to a series of storm centers or "waves" moving in the same general easterly direction along the front. For instance, rain began at Memphis about 7 p. m., January 16, and at Pittsburgh about 8 a. m. of the following day, an interval of 13 hours. Also, on January 23 rain began at Memphis about 5 p. m., and at Pittsburgh about 8 a. m. of January 24, 15 hours later. These storm centers were more or less independent but at times followed one another so closely that it is difficult to distinguish one from the other.

These storm centers are produced by wave action or oscillatory movements along the boundary between air masses. It is apparent that, when these waves are fairly well developed, the greater rate of rise of the TA air associated with these disturbances is sufficient normally to produce an increase in the intensity of precipitation.

Synopsis of weather maps, January 20–25, 1937.[7]—The synoptic situation which produced heavy flood rains in the Ohio drainage area between December 25, 1936, and January 25, 1937, is best typified by the series of weather maps from January 20–25, inclusive, when the most intense rainfall occurred. (See figs. 9 and 17–22.)

During this entire period a steep pressure gradient, producing southerly winds, prevailed over the eastern Gulf of Mexico and caused a continuous inflow of moist tropical-Atlantic (TA) air over the southeastern United States. Central and northeastern sections of the country were covered by a series of outbreaks of relatively fresh polar air, mostly of continental origin. The polar "front" between these sharply contrasting air masses underwent a series of northward and southward movements at various points, but its main pivot point was relatively stationary in the vicinity of northern Alabama, where usually the northward flow of TA air at the surface was forced aloft. Assuming that the anticyclonic trajectory continues as the TA air rises, it is not surprising that most of the precipitation was directed northeastward over the Ohio River.

[7] From notes prepared by A. K. Showalter. U. S. Weather Bureau, Washington, D. C.

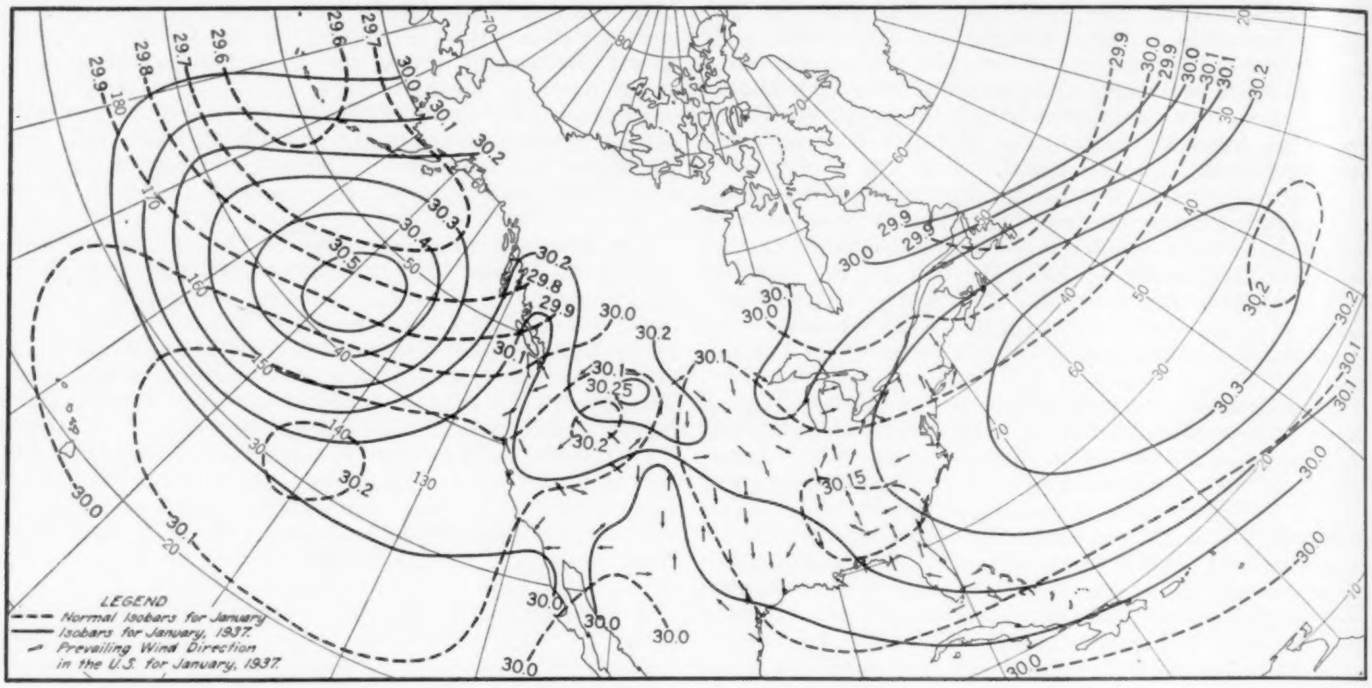

FIGURE 15.—Isobars for January 1937.

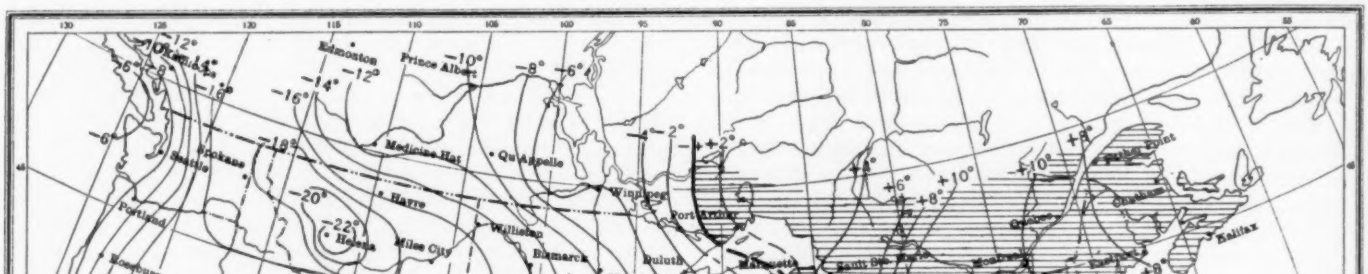

FIGURE 16.—Departure (°F.) of the mean temperature from the normal, January 1937.

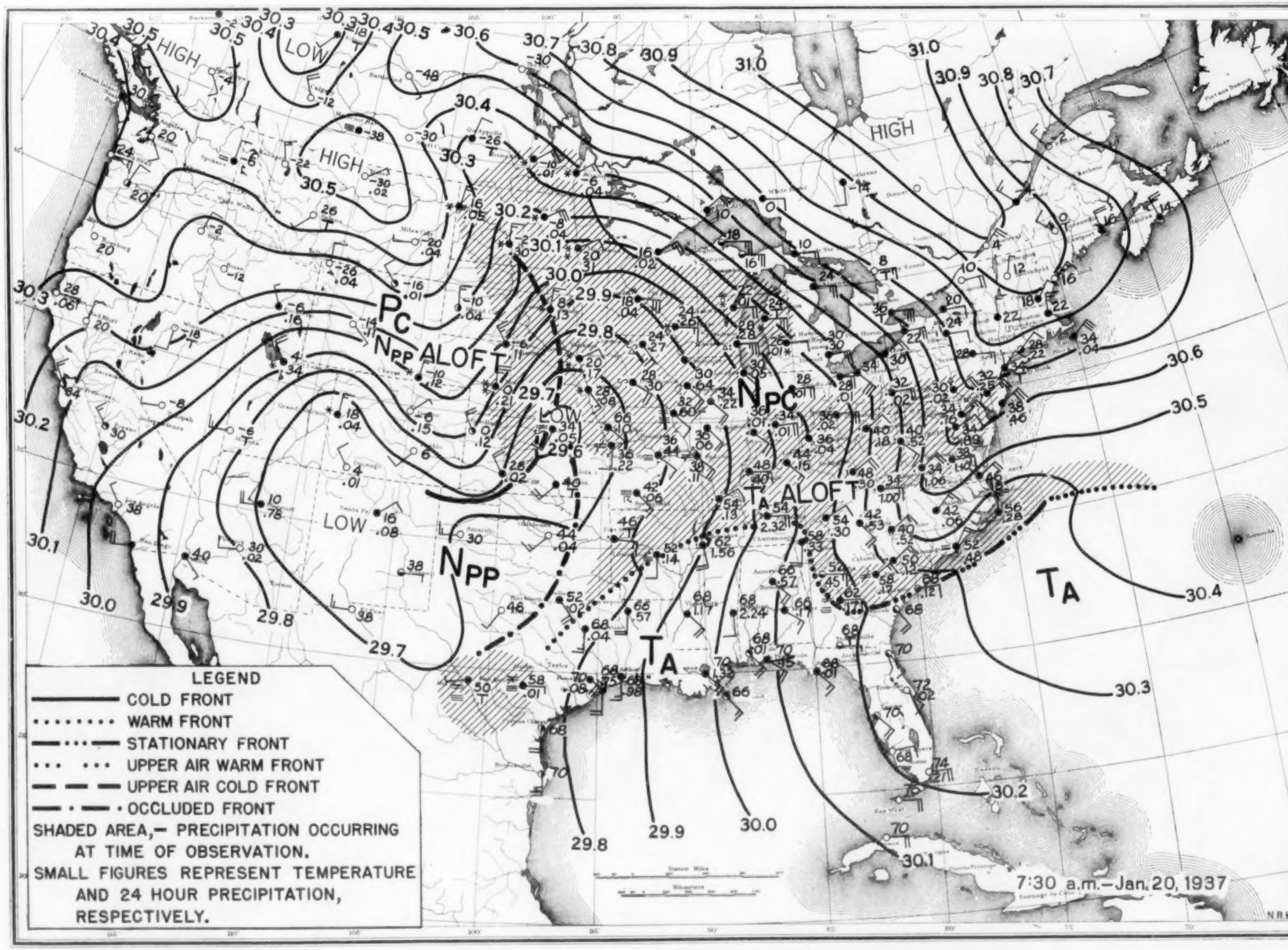

FIGURE 17.—Weather map, 7:30 a. m., January 20, 1937.

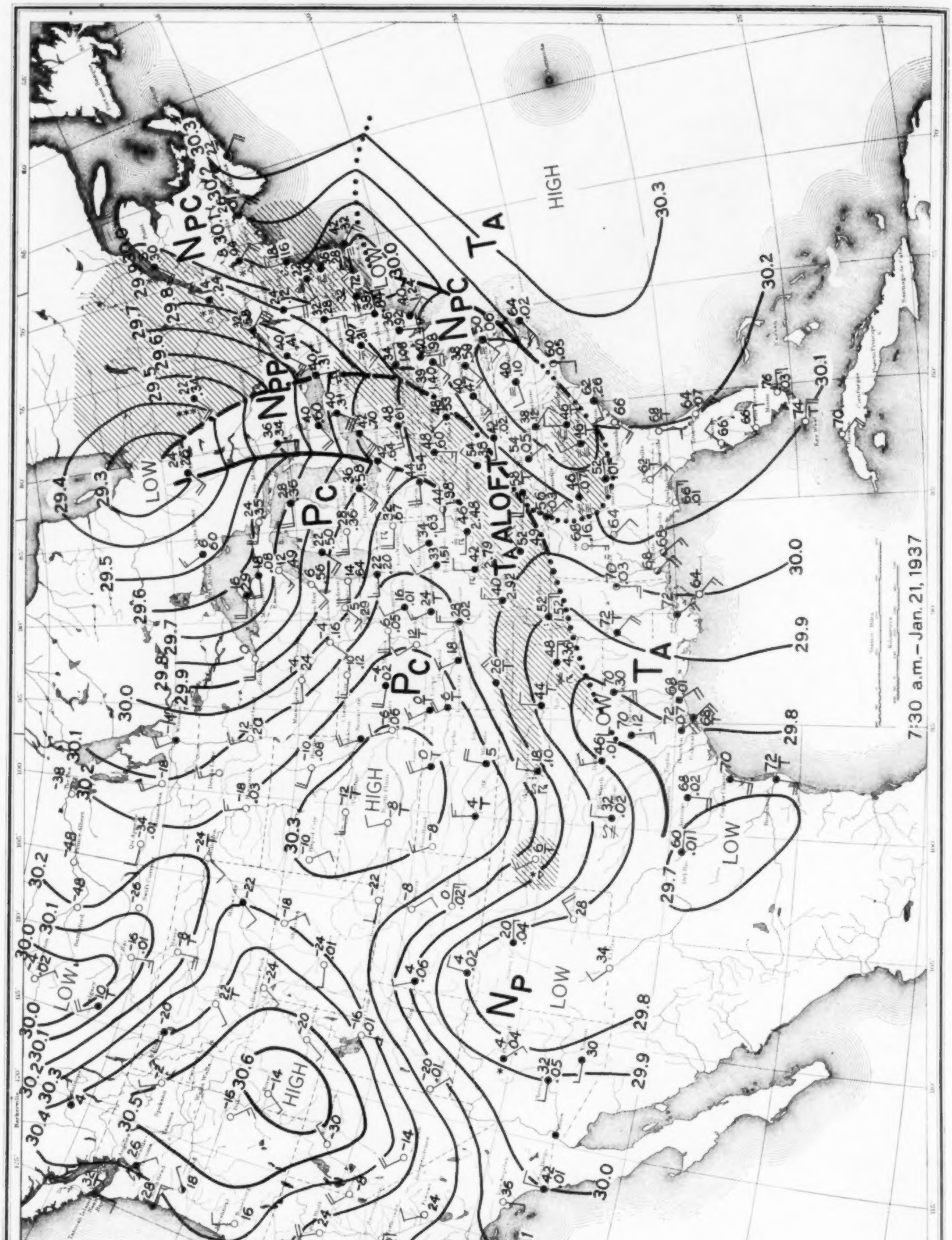

FIGURE 18.—Weather map, 7:30 a. m., January 21, 1937.

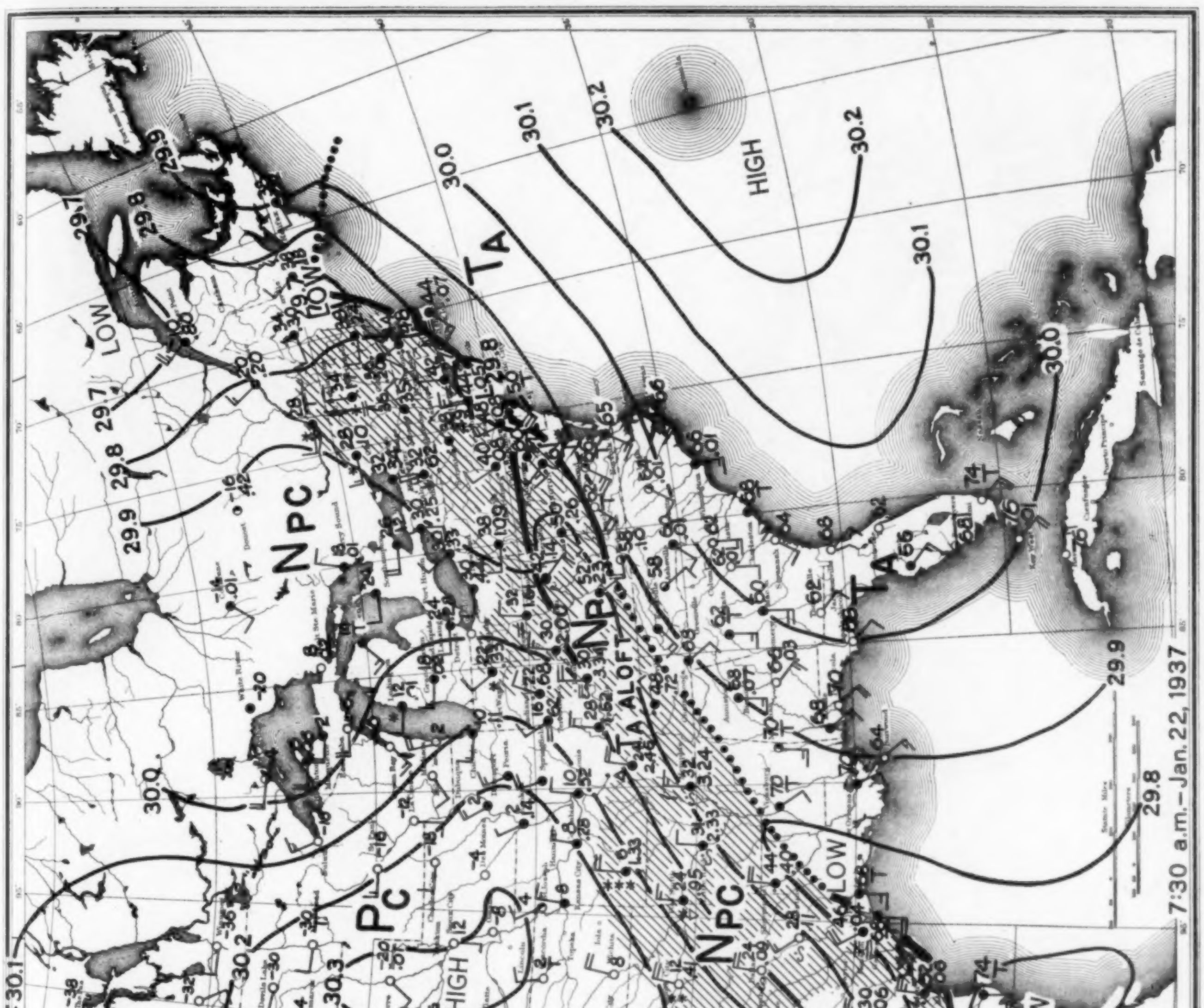

FIGURE 19.—Weather map, 7:30 a. m., January 22, 1937.

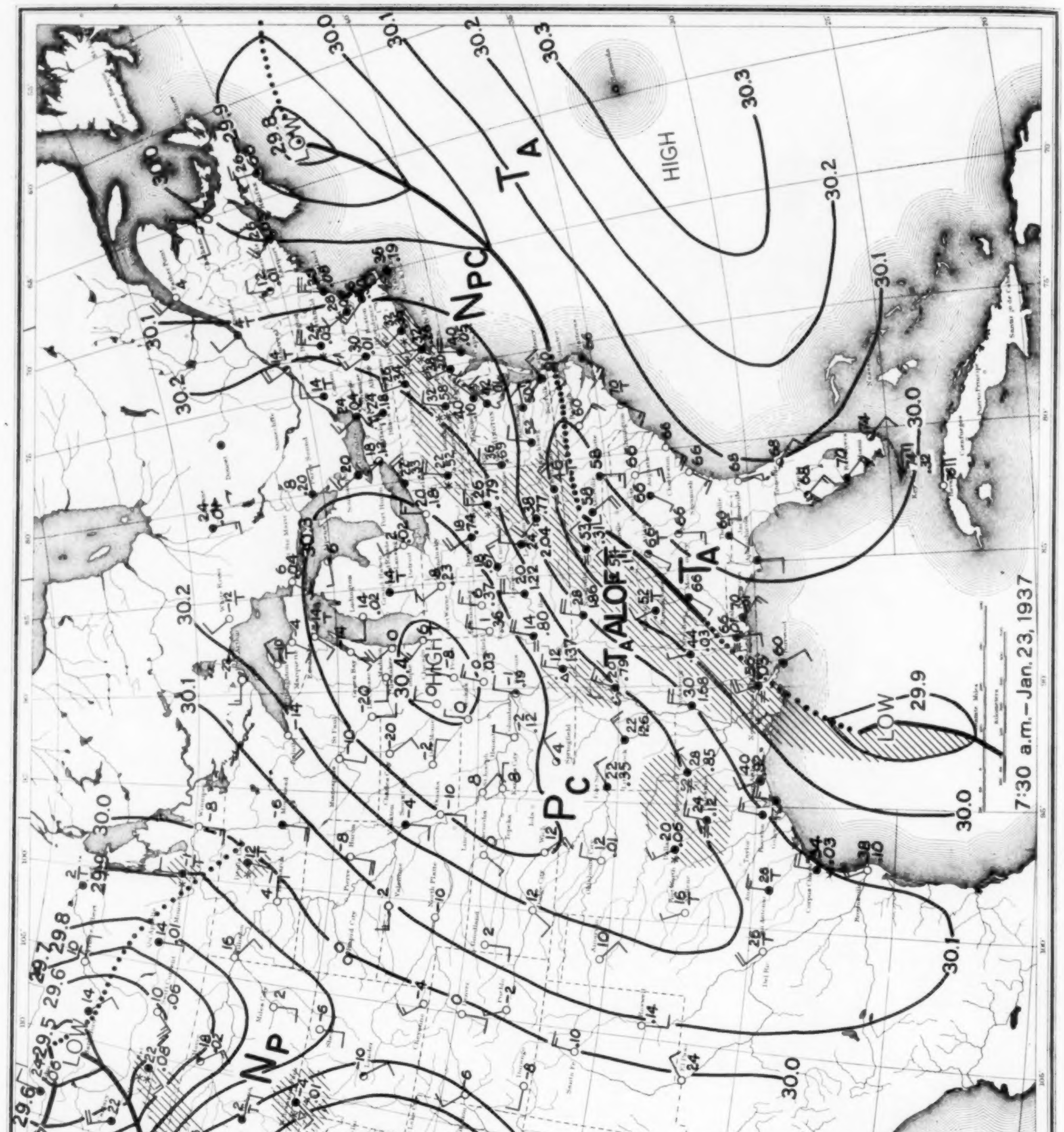

FIGURE 20.—Weather map, 7:30 a. m., January 23, 1937.

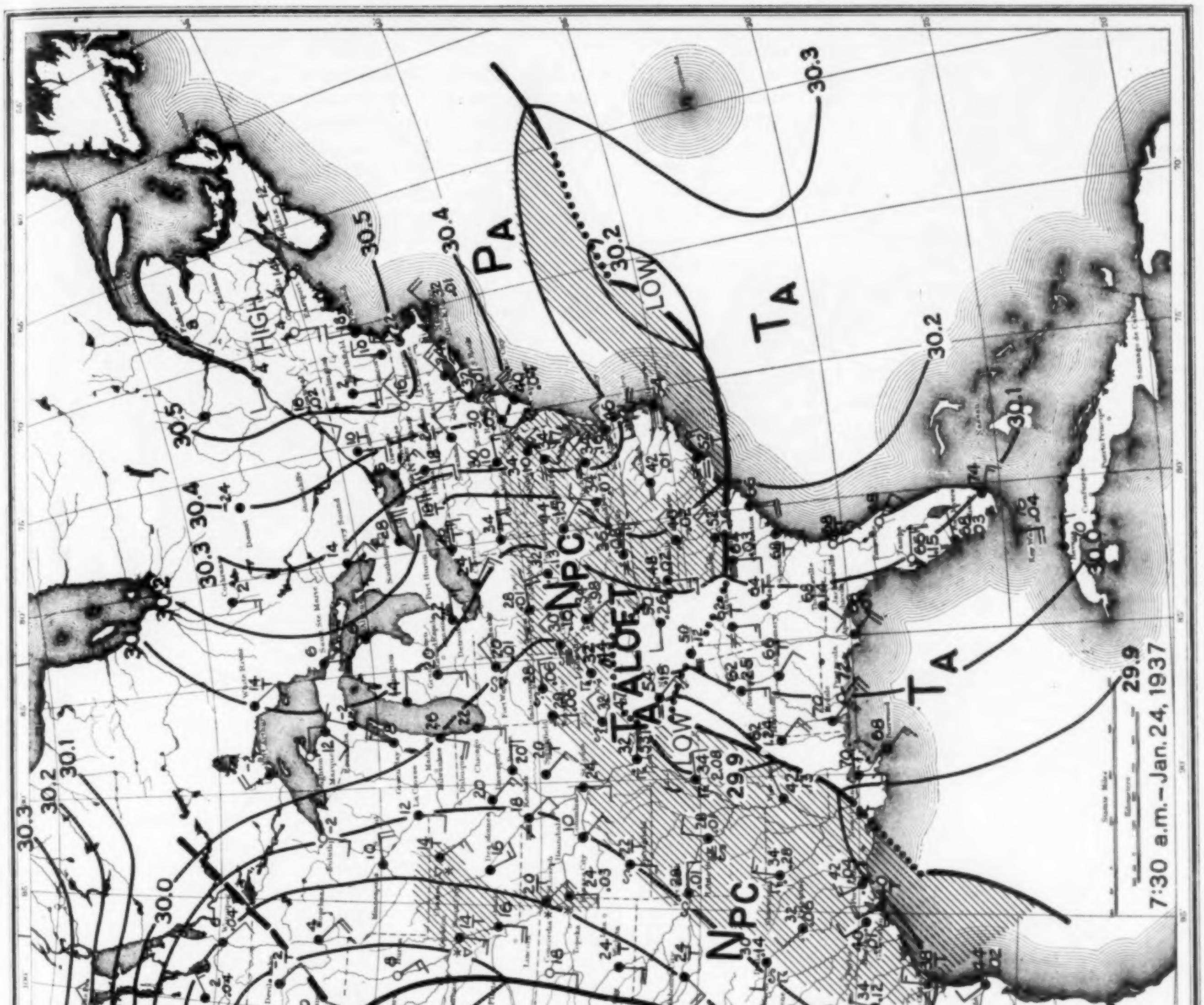

FIGURE 21.—Weather map, 7:30 a. m., January 24, 1937.

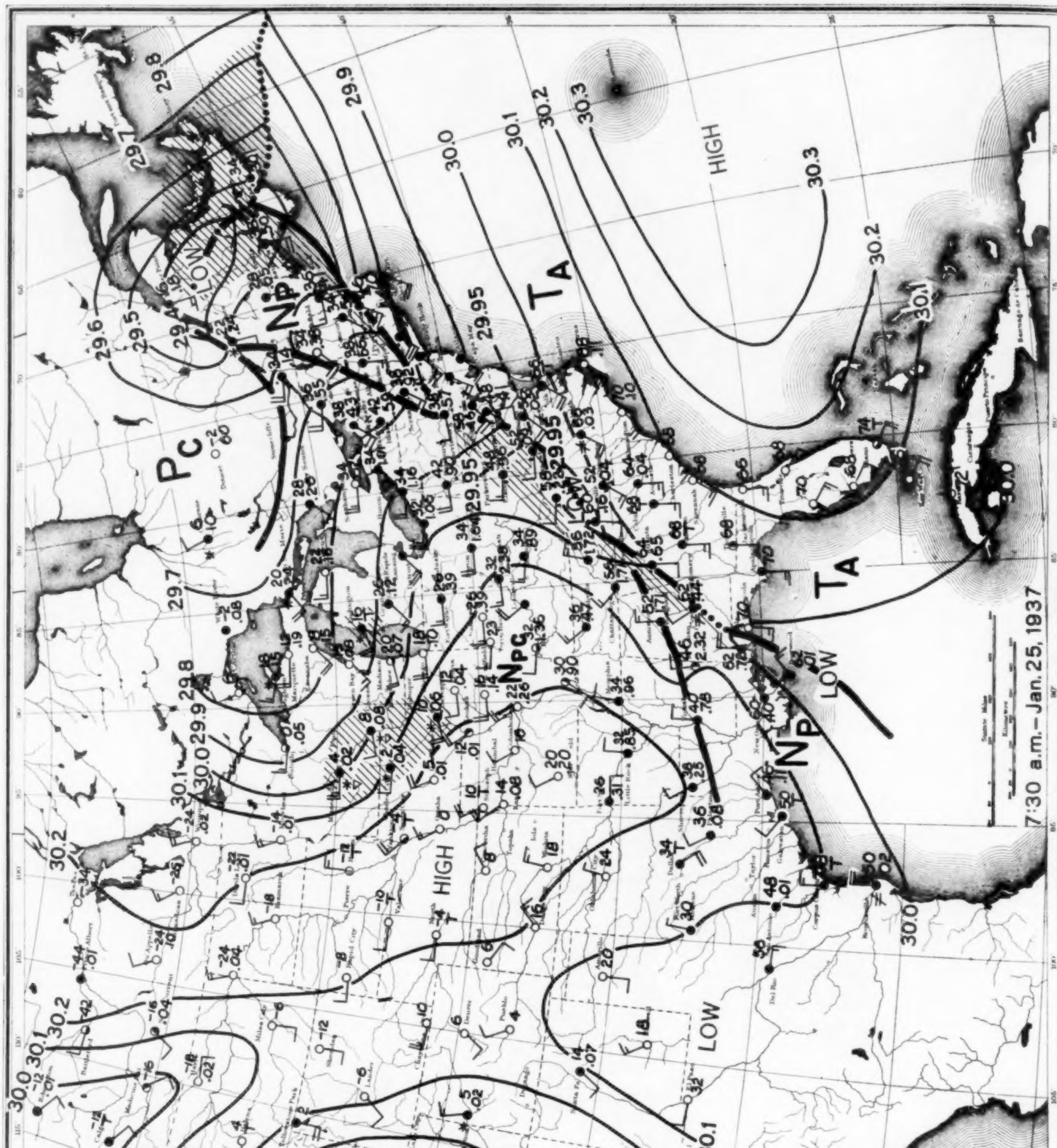

FIGURE 22.—Weather map, 7:30 a. m., January 25, 1937.

The sequence of meteorological events during this period is summarized briefly as follows:

On the morning of January 20 a well-developed barometric depression over northeastern Kansas was surrounded by Transitional Polar-Continental (NPC) air to the east and north, Polar Continental (Pc) air to the northwest, and Transitional Polar Pacific (NPP) air to the south. Southeast of the LOW a mass of TA air over the Gulf States was overrunning the NPC air and producing rainfall, the heaviest of which was occurring over western Tennessee. By the morning of January 21 the disturbance had moved rapidly northeastward to the lower Hudson Bay region, and the Pc air covered most of the Great Lakes region and the Missouri and Mississippi Valleys. The main front extended roughly from central Pennsylvania to eastern Texas, and the heaviest 24-hour precipitation extended from 100 to 300 miles northwest of the front's position at that time. The front gradually shifted and, on the morning of January 22, was located about 250 miles southeastward. In this position, with oscillatory movement, or wave action, continuing along the boundary, the overrunning of TA air caused moderate to heavy precipitation from Arkansas to western New York. On the morning of January 23 the polar air covered all of the eastern portion of the country except the Carolinas, Georgia, Florida, and southern Alabama. Action continued between the Pc and TA air masses and precipitation was general over the southwestern portion of the Ohio Basin and the lower Mississippi River. During the next 24 hours, wave action led to the formation of a disturbance over western Tennessee on January 24 and moderate rains continued over the lower Ohio Valley. This disturbance deepened considerably and moved rapidly northeastward from the morning of January 24 to the morning of January 25. Excessive precipitation again fell over most of the Ohio Basin, ending generally by the early morning of January 25.

The morning of January 25 marked the "break-up" of the conditions which had been causing the prolonged rain period. Polar air, mostly of continental origin, now covered the entire Ohio Basin, and the front had moved to a point over the Southeastern States. (See fig. 22.) A gradual decrease in pressure at Bermuda occurred after this date and the front continued to move out over the ocean. On January 29 the morning pressure at Bermuda dropped below 30.16 inches for the first time since the flood period began.

The North Atlantic HIGH was located southeast of its normal position during most of February and the Bermuda pressure averaged 0.11 inch below normal. The precipitation over most of the Ohio and Mississippi Basins during February was likewise below normal.

While there was movement of air masses and pressure systems during the period January 20–25, there was sufficient retardation of the principal polar front to permit TA air to flow aloft over the Ohio River Basin for an extended period, thereby causing copious precipitation in that region. The immediate cause of the persistent rainfall seems to have been the steep pressure gradient which was maintained in the moist TA air over the eastern Gulf of Mexico.

Typical storms producing Ohio River floods.—Winter and spring months in which there occurs an increase in pressure and a westward extension of the Azores HIGH are generally associated with floods in the Ohio and lower Mississippi Rivers.[8] This is illustrated in the floods of January and February 1882, February 1884, January and March 1913, January 1937, and others.

Three flood-producing storms, occupying quite different positions over the Ohio Valley, have been selected and are shown in figure 23.

Of these storms, that of March 23–27, 1913 (A) occupies the most northerly position of the three storms. This storm is one of the greatest of record in eastern United States, both in rainfall of high intensity and corresponding area covered. The greater part of the precipitation occurred within a 3-day period.

As a result of this storm, all previous high stages of record were exceeded in the Beaver, Mahoning, Muskingum, Scioto, Olentangy, Little Miami, Miami, White of Indiana, and Wabash Rivers. The discharges from these northern tributary streams caused the highest stages of record up to that time on the Ohio between New Martinsville, W. Va., and Cincinnati, Ohio, as well as at Madison, Ind. At other points on the river the record 1884 stage was not reached. Tributaries from the south were not seriously affected.

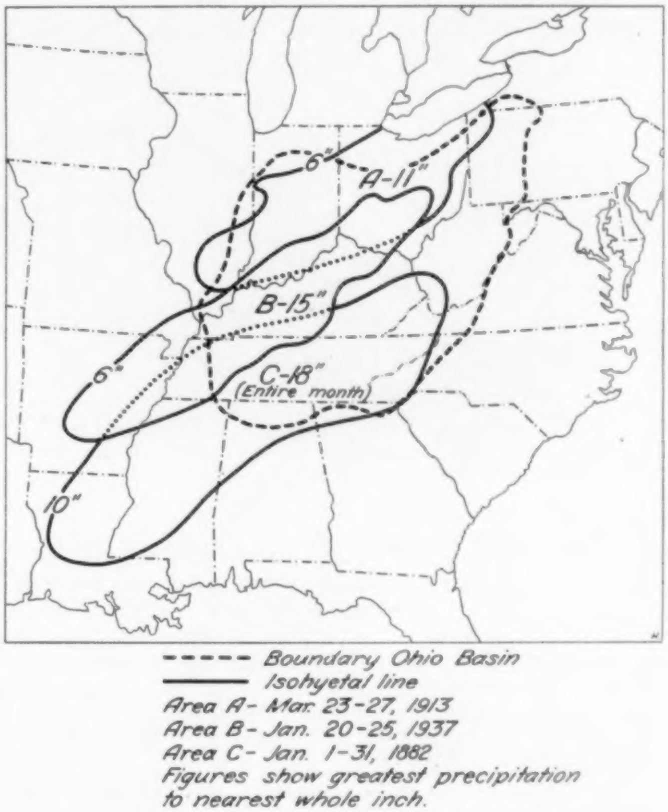

FIGURE 23.—Storm rainfall areas in Ohio River Basin.

The precipitation area for January 1882 (C) is located in the other extreme position, centering over the southern portion of the Ohio Basin. The precipitation for the entire month is used because the scarcity of rainfall reports makes it difficult to locate the individual storm areas. The rainfall was particularly heavy in the Tennessee and Cumberland Basins. The Cumberland reached a crest stage of 55.1 feet at Nashville, Tenn., and the Tennessee crested at Johnsonville, Tenn., at 43.8 feet.

The storm area of January 20–25, 1937 (B), occupies a central position over the Ohio Basin. It would be difficult to superimpose a storm in a more critical position than that actually taken by the storm of January 1937 to produce a great flood. It followed generally heavy rains

[8] W. J. Humphreys. Why Some Winters are Warm and Others Cold in the Eastern United States. Monthly Weather Review, vol. 42, 1914, pp. 672-675 (see charts).

over the entire basin, and was appropriately timed, as well as ideally situated, to produce the maximum flood of record.

The major axes of the three storms lie in quite different positions but are practically parallel. This is further illustrated in figure 24 in which the major axes of a number of storms of this type are shown.

The axes of the storms were obtained from the rainfall charts prepared by the Miami Conservancy District,[9] except in the case of the January 1882 and 1937 storms. The storms of October 4–6, 1910, and November 17–21, 1906, are included because they have characteristics similar to the winter and spring storms which produce Ohio River floods.

FIGURE 24.—Axes of storm rainfall areas in Ohio River Basin.

An interesting relation between the positions of the storm axes and the positive departures from normal pressure at Bermuda, during the period of the storms, is shown in the following table. The greatest departure from normal occurred during the March 1913 storm whose axis occupies the most northerly position over the Ohio Basin. The January 1882 storm, located farthest south, has the smallest departure from normal. The storms are arranged in the order of their positions from north to south in the table and a corresponding decrease in the magnitude of the departures occurs in that same order with a surprising consistency.

The definite parallelism of the storm axes (fig. 24) indicates that this is a regional characteristic of storms of this type. This fact seems to preclude any justification, in transposing such storms, for changing the direction of the axes. It is noted that the 1937 storm occupies the most critical position relative to a north and south displacement. Therefore, the only remaining possibility for a more critical storm position would be to move the area of the heaviest precipitation northeastward, thereby placing more of that area directly over the Ohio Basin. Transposition in this direction, however, appears to be definitely limited by the Bermuda HIGH to the western slope of the Appalachian Mountains.

Average pressure at Bermuda with departure from normal during period of Ohio Valley storms

Storm period	Average pressure	Departure from normal
	Inches	*Inches*
Mar. 23–27, 1913	30.53	+0.39
Oct. 4–6, 1910	30.35	+.28
Jan. 10–12, 1913	30.41	+.25
Jan. 20–25, 1937	30.36	+.20
Nov. 17–21, 1906	30.26	+.18
January 1882	30.25	+.09

The 1913 storm is centered farther east, as well as farther north, than any of the other storms considered. A line joining the centers of the storms is roughly parallel to the Appalachian Mountains.

CREST STAGES IN THE 1937 FLOOD[10]

The Ohio River flood of 1937 was by far the greatest flood of record in the greater length of that river and in a considerable portion of the lower Mississippi. Figure 25 compares crest stages along the Ohio and lower Mississippi Rivers in the flood of 1937 with the previous highest stages of record. The crest of the 1937 flood was considerably under the 1936 record stages of 46.0 feet at

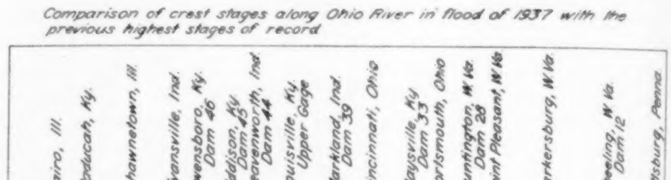

FIGURE 25.—Comparison of crest stages in the Ohio and lower Mississippi Rivers in flood of 1937, with previous highest stages of record.

[9] Miami Conservancy District, Dayton, Ohio, Storm Rainfall of Eastern United States, Technical Report, part V (revised) 1936.

[10] An earlier report on the 1937 floods appears in Monthly Weather Review, vol. 65, pp. 71–86.

Pittsburgh and 55.2 feet at Wheeling, W. Va. At Parkersburg and Point Pleasant, W. Va., the record stages of the March 1913 flood also were unsurpassed in 1937, but to a lesser degree. However, from slightly below Point Pleasant to a point in the lower Mississippi slightly below Helena, Ark., and at Natchez, Miss., all previous records were exceeded; Cincinnati, by 8.9 feet; Louisville, 10.4 feet; Evansville, 5.4 feet; Cairo, 3.1 feet, and Memphis, 3.7 feet.

Hourly stage readings were made under supervision of the Cincinnati Weather Bureau Office from January 15 to February 5 and are presented in table 10. The greatest 24-hour (midnight to midnight) rises, 6.4 and 6.3 feet, occurred on January 18 and 21, respectively. During the afternoon of January 21, the river passed 71.1 feet, the highest known stage up to that time. After passing this record height, the river rose 5.1 feet on January 22; 0.9 foot, January 23; 4.4 feet, January 24, and 2.6 feet, January 25. These rates of rise at unprecedented stages show that an enormous volume of water passed down the Ohio during the critical period of the great flood.

TABLE 10.—*Hourly river stages at West End power plant,[1] Cincinnati, Ohio*

	A. m.											
	1	2	3	4	5	6	7	8	9	10	11	Noon
1937												
Jan. 15	48.2	48.6	48.8	49.0	49.1	49.5	49.8	50.0	50.2	50.4	50.7	50.8
16	51.6	51.7	51.6	51.6	51.5	51.4	51.3	51.2	51.1	50.9	50.8	50.7
17	49.5	49.5	49.4	49.4	49.3	49.3	49.2	49.2	49.2	49.2	49.2	49.2
18	50.3	50.6	51.0	51.4	51.7	52.0	52.2	52.4	52.8	53.1	53.5	53.9
19	56.5	56.7	56.9	57.0	57.1	57.1	57.2	57.3	57.4	57.4	57.5	57.6
20	58.4	58.5	58.6	58.7	58.7	58.8	58.9	58.9	59.0	59.1	59.2	59.3
21	60.9	61.1	61.4	61.7	62.0	62.3	62.5	62.8	63.1	63.3	63.6	63.8
22	67.4	67.9	68.2	68.4	68.8	69.1	69.4	69.6	69.8	70.0	70.2	70.4
23	72.2	72.3	72.4	72.4	72.5	72.6	72.6	72.7	72.7	72.8	72.8	72.8
24	73.2	73.3	73.3	73.3	73.4	73.4	73.4	73.5	73.5	73.7	73.9	74.1
25	77.7	77.8	78.0	78.3	78.4	78.6	78.7	78.9	79.0	79.1	79.2	79.3
26	80.0	80.0	80.0	[2] 80.0	80.0	80.0	80.0	79.9	79.9	79.9	79.8	79.8
27	79.6	79.6	79.6	79.6	79.6	79.6	79.6	79.5	79.5	79.5	79.4	79.4
28	79.0	79.0	78.9	78.9	78.9	78.8	78.8	78.8	78.7	78.7	78.6	78.6
29	78.1	78.0	78.0	77.9	77.9	77.8	77.8	77.6	77.6	77.5	77.5	77.4
30	76.6	76.6	76.5	76.4	76.3	76.3	76.1	76.1	76.0	75.9	75.8	75.8
31	74.6	74.6	74.4	74.4	74.3	74.2	74.1	74.0	73.8	73.8	73.7	73.6
Feb. 1	72.2	72.1	72.0	71.9	71.7	71.7	71.6	71.5	71.3	71.2	71.0	70.9
2	69.2	69.1	68.9	68.7	68.6	68.5	68.3	68.1	67.8	67.7	67.5	67.4
3	65.2	65.0	64.8	64.6	64.4	64.2	63.9	63.7	63.4	63.2	63.0	62.8
4	59.9	59.6	59.3	59.0	58.8	58.5	58.2	57.9	57.6	57.2	57.0	56.6
5	53.1	52.8	52.5	52.2	51.8	51.5	51.2	50.8	-------	-------	-------	-------

	P. m.											
	1	2	3	4	5	6	7	8	9	10	11	12 mt.
1937												
Jan. 15	50.9	51.0	51.1	51.2	51.3	51.3	51.4	51.4	51.5	51.5	51.6	51.6
16	50.6	50.5	50.4	50.2	50.0	49.9	49.8	49.8	49.7	49.7	49.6	49.6
17	49.1	49.1	49.1	49.1	49.1	49.1	49.1	49.2	49.3	49.5	49.7	49.9
18	54.1	54.3	54.5	54.8	55.0	55.2	55.4	55.6	55.7	55.9	56.1	56.3
19	57.7	57.8	57.8	57.9	58.0	58.0	58.1	58.2	58.2	58.3	58.3	58.4
20	59.4	59.5	59.6	59.8	59.9	60.0	60.1	60.2	60.3	60.4	60.5	60.7
21	64.1	64.3	64.5	64.7	64.9	65.1	65.4	65.7	66.1	66.4	66.7	67.0
22	70.6	70.8	71.0	71.2	71.3	71.5	71.6	71.7	71.8	71.9	72.0	72.1
23	72.8	72.8	72.8	72.8	72.8	72.9	72.9	72.9	73.0	73.0	73.0	73.0
24	74.3	74.5	74.6	74.9	75.2	75.5	75.9	76.2	76.5	76.8	77.1	77.4
25	79.4	79.5	79.6	79.6	79.7	79.7	79.8	79.8	79.9	79.9	79.9	80.0
26	79.8	79.8	79.8	79.8	79.8	79.8	79.7	79.7	79.7	79.7	79.7	79.6
27	79.3	79.3	79.3	79.2	79.2	79.2	79.2	79.1	79.1	79.1	79.1	79.1
28	78.6	78.5	78.5	78.4	78.4	78.4	78.4	78.3	78.3	78.2	78.2	78.2
29	77.4	77.3	77.2	77.1	77.1	77.0	76.9	76.9	76.9	76.8	76.8	76.7
30	75.7	75.5	75.5	75.4	75.3	75.2	75.2	75.1	75.0	74.9	74.8	74.8
31	73.5	73.4	73.4	73.2	73.1	73.0	72.8	72.8	72.7	72.6	72.5	72.4
Feb. 1	70.8	70.6	70.4	70.3	70.2	70.1	70.0	69.9	69.8	69.6	69.5	69.4
2	67.2	67.1	67.0	66.8	66.6	66.5	66.3	66.0	65.9	65.8	65.6	65.4
3	62.6	62.3	62.2	62.0	61.8	61.5	61.3	61.2	61.0	60.8	60.4	60.0
4	56.4	56.2	56.0	55.7	55.4	55.2	54.9	54.6	54.3	54.0	53.7	53.4
5	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------

[1] Elevation of zero of gage, 428.80 feet above mean sea level.
[2] Crest 79.99 at 4 a. m., Jan. 26.

Daily river stages during January and February at stations in the Ohio and lower Mississippi Basins are presented in tables 11 and 12. The stage hydrographs for selected points along the Ohio and lower Mississippi Rivers are shown in figure 26.

The January 1937 flood was entirely a "down river" flood, as illustrated in figure 27. The highest stages of record on the Licking and Kentucky Rivers occurred in their lower reaches, while floods were not experienced in the upper portions. Although the Green and Cumberland Rivers were above flood stage at all points, previous records were exceeded only in the lower portions. The tributaries of the Ohio River in West Virginia and extreme eastern Kentucky were not in flood, except in the extreme lower reaches where flood stage was only slightly exceeded. The Tennessee River did not reach flood stage above Chattanooga, Tenn., and, although high stages prevailed in the lower portion of the basin, no records were broken except near the mouth, due to backwater from the Ohio River. The northern tributaries of the Ohio River were generally higher in their lower reaches.

The concentration of the heavy and excessive rains along the entire length of the Ohio River channel during the latter portion of the period resulted in the river reaching a crest almost simultaneously along the greater part of its length. Thus, the crest occurred at Pittsburgh, 3 a. m., January 26; at Cincinnati, 4 a. m., January 26, and at Point Pleasant, almost midway between these two points, at 8 a. m., January 27, the same time the crest occurred at Louisville, Ky. (See fig. 28.)

In contrast, the March 1936 flood, which originated in the tributaries of the upper Ohio, produced a crest at Pittsburgh on March 18; Point Pleasant, March 22; Cincinnati, March 28; and Louisville, March 29–30.

A noticeable progression of the crest did not occur in the 1937 flood above Dam No. 44, some distance downstream from Louisville. The crest traveled from Dam No. 44 at 7 a. m., January 27, to Cairo, Ill., at 8 a. m., February 3, a distance of 316 miles in 169 hours. From Cairo the flood crest moved down the Mississippi River at a rather uniform rate, reaching Memphis, a distance of 227 miles, on February 10; Vicksburg, Miss., a distance of 602 miles, February 21, and New Orleans, a distance of 966 miles, on February 28.

Table 13 presents a record of flood-crest stages and times of occurrence at selected stations on the Ohio and lower Mississippi Rivers and principal tributaries, and a comparison of the flood heights in 1937 with those of the previous highest of record.

THE EXTENT OF FLOOD LOSS AND DAMAGE

The results of a comprehensive survey by the Corps of Engineers, United States Army, of the tangible loss and damage, caused by the flood, are shown in the table below. The total, $417,685,557, does not include losses of an intangible nature or expenditures by Government and other agencies for flood protection and relief.

OHIO RIVER BASIN:			
Illinois	$17, 400, 000	West Virginia	$21, 000, 000
Indiana	55, 000, 000	Kentucky	219, 800, 000
Ohio	88, 300, 000	Tennessee	5, 000, 000
Pennsylvania	4, 700, 000		
		Total	411, 200, 000
Mississippi River and tributaries below Cairo, Ill.			[1] 6, 485, 557
Grand total			$417, 685. 557

[1] Including $192,000 in Louisiana, principally livestock.

TABLE 11.—*Daily river gage readings (in feet and tenths) during January*

Station	River	Flood stage	January 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Johnstown, Pa	Stony Creek	15	6.2	5.4	6.4	5.7	5.7	5.0	5.2	6.6	7.2	7.4	9.1	7.2	6.2	5.6	5.5
Saltsburg, Pa	Kiskiminetas	16	4.8	4.1	5.0	4.7	4.1	3.6	3.4	5.4	5.3	5.1	8.5	6.0	5.0	4.4	4.8
Olean, N. Y	Allegheny	----	5.4	4.9	4.6	4.2	3.3	2.7	2.4	3.1	3.7	3.4	3.2	3.0	2.7	3.2	8.8
Warren, Pa	do	12	5.8	5.0	4.5	4.2	3.5	2.8	2.3	3.5	4.3	4.5	4.0	3.5	2.9	3.5	9.1
Franklin, Pa	do	17	10.2	9.2	8.4	7.8	7.1	6.3	5.7	7.8	9.2	9.3	8.6	7.6	6.8	6.5	14.3
Parkers Landing, Pa	do	20	10.6	9.4	8.5	7.8	7.0	5.8	5.1	6.3	9.0	8.9	8.2	7.6	6.4	5.9	13.6
Lock No. 8	do	24	20.0	18.9	18.4	17.6	16.4	15.5	14.8	15.2	17.9	18.1	18.0	17.2	16.2	15.4	20.0
Lock No. 5	do	24	19.9	19.4	19.1	18.1	16.8	15.9	15.2	16.4	18.2	18.7	20.7	18.6	17.1	16.2	19.5
Lock No. 4	do	24	19.2	18.6	18.2	17.4	16.3	15.3	14.4	15.5	17.4	18.0	19.6	17.9	16.5	15.5	18.4
Lock No. 3	do	25	19.5	19.0	18.8	17.8	16.8	15.9	15.0	15.9	17.7	18.4	19.8	18.5	17.0	16.0	18.3
Elkins, W. Va	Tygart	15	4.6	4.2	8.7	5.2	3.8	3.2	3.4	5.5	4.1	3.5	3.7	4.1	3.5	3.1	3.1
Philippi, W. Va	do	20	6.8	7.2	12.1	9.2	7.0	5.8	5.2	7.9	7.1	6.3	9.0	8.6	7.0	5.9	5.8
Weston, W. Va	West Fork	20	3.4	2.8	6.6	2.5	1.4	1.1	1.9	3.7	2.0	2.1	6.9	3.4	1.8	1.4	3.0
Confluence, Pa	Youghiogheny	14	5.2	4.5	5.0	5.4	4.5	4.0	4.2	6.0	5.9	6.6	9.4	6.5	5.7	4.7	4.4
Connellsville, Pa	do	13	5.6	4.8	5.8	6.1	5.0	4.3	4.2	6.8	6.5	6.5	10.9	7.7	6.1	5.2	4.9
West Newton, Pa	do	20	4.4	4.6	5.2	4.9	4.0	3.0	2.6	5.6	5.4	5.2	13.4	8.1	5.5	4.2	4.2
Lock No. 15	Monongahela	22	10.5	10.5	14.0	13.1	10.6	9.6	9.1	10.7	10.7	11.2	17.3	13.2	10.9	10.0	9.6
Lock No. 10	do	25	11.1	11.2	14.0	13.8	11.6	10.6	10.2	11.6	11.8	12.0	17.8	14.0	11.8	10.7	10.3
Lock No. 7	do	30	14.7	16.1	19.7	19.6	15.8	13.7	13.3	16.9	17.0	17.2	25.3	20.7	17.6	16.2	14.1
Lock No. 4	do	30	15.0	16.0	18.3	19.5	17.2	15.4	14.5	16.4	16.8	16.5	24.4	21.6	18.0	16.4	16.2
McKeesport, Pa	do	20	5.3	5.8	7.3	8.0	6.7	5.6	5.2	6.3	6.6	6.5	12.2	10.3	7.4	6.2	6.3
Beaver Falls, Pa	Beaver	15	7.1	6.6	6.6	6.2	5.7	5.4	5.0	5.7	6.9	7.2	7.2	6.6	6.1	5.9	10.4
Walhonding, Ohio	Walhonding	8	4.2	2.5	2.5	2.4	2.3	2.1	1.6	2.5	3.7	4.5	4.4	3.4	2.6	2.6	16.9
Newcomerstown, Ohio	Tuscarawas	16	9.6	9.4	8.7	8.3	7.5	6.8	6.4	6.8	7.8	8.8	9.6	9.3	8.5	7.9	12.2
Coshocton, Ohio	do	11	6.9	6.5	5.8	5.5	5.2	4.5	3.9	4.3	5.6	6.2	7.0	6.7	5.7	5.8	12.8
Lock No. 10	Muskingum	25	14.7	14.2	13.5	12.5	11.7	10.8	10.2	11.1	11.8	14.3	15.2	14.3	13.4	12.7	21.1
Lock No. 7	do	22	13.6	13.7	13.1	11.9	11.2	10.1	9.4	9.9	10.8	13.7	14.9	14.0	12.8	12.0	21.0
Lock No. 1	do	35	19.1	20.2	22.0	21.9	20.9	19.0	16.3	15.2	15.1	20.7	25.9	26.8	26.5	22.2	23.5
Glenville, W. Va	Little Kanawha	23	3.4	5.8	12.5	6.0	4.5	3.8	4.8	6.5	5.0	5.6	15.5	6.4	5.2	4.3	5.3
Creston, W. Va	do	20	7.1	6.8	13.3	6.6	5.2	4.6	4.8	8.0	6.7	7.2	15.0	11.8	6.6	5.3	6.6
Athens, Ohio	Hocking	17	10.5	6.4	7.2	6.0	4.2	4.2	4.6	5.6	5.3	9.8	14.7	10.0	6.2	5.4	16.2
Summersville, W. Va	Gauley	18	7.6	6.4	9.2	8.1	6.6	5.7	6.7	7.4	6.1	5.9	6.1	6.3	5.4	5.4	5.5
Ivanhoe, Va	New	15	4.5	7.3	7.4	8.7	5.4	3.4	3.8	3.5	3.4	2.4	2.6	1.7	3.4	3.4	3.7
Hinton, W. Va	do	14	4.7	5.2	8.0	7.3	5.4	4.2	3.8	3.8	3.8	3.4	3.3	3.1	3.1	3.4	3.6
Clay, W. Va	Elk	18	4.1	5.5	8.8	7.0	5.1	4.2	3.8	4.8	5.4	5.8	7.0	6.4	5.2	4.3	4.0
Kanawha Falls, W. Va	Kanawha	25	6.4	7.9	13.3	13.0	10.0	7.7	6.3	6.0	6.4	5.9	5.4	5.2	4.6	4.5	5.0
London Dam	do	43	11.7	13.2	19.4	19.3	16.5	13.4	12.0	12.0	11.9	11.3	11.0	10.9	10.4	10.4	10.8
Logan, W. Va	Guyandot	20	3.8	4.4	8.8	5.1	3.9	3.4	3.2	3.0	3.0	3.0	2.9	2.9	2.9	2.9	3.6
Wayne, W. Va	Twelvepole Creek	25	4.3	8.4	11.3	6.2	4.3	3.5	6.2	4.7	3.9	3.8	8.0	5.9	4.7	4.1	10.8
Williamson, W. Va	Tug Fork	38	5.8	6.6	13.7	7.9	6.4	5.3	4.7	4.5	4.4	4.2	4.1	4.0	4.1	4.8	6.4
Pikeville, Ky	Levisa Fork	35	7.9	6.8	18.8	9.6	5.4	3.8	3.1	2.8	2.5	2.4	2.0	2.0	2.0	3.8	5.8
Paintsville, Ky	do	40	7.3	12.6	20.4	20.2	11.6	8.2	6.8	6.5	6.0	5.5	6.8	5.9	5.7	5.6	10.1
Lock No. 3	Big Sandy	45	7.5	14.2	23.5	25.5	18.8	15.5	9.8	9.6	8.8	8.0	9.2	10.0	9.8	8.8	10.8
Delaware, Ohio	Olentangy	9	3.8	2.4	2.1	2.2	1.9	1.6	1.4	1.9	3.3	5.0	3.9	2.7	2.0	9.2	13.1
La Rue, Ohio	Scioto	11	5.7	4.6	4.2	4.0	3.8	3.8	3.8	4.0	6.3	8.0	7.2	5.3	4.6	8.2	13.9
Prospect, Ohio	do	10	4.7	4.9	4.8	4.6	4.4	4.2	4.2	4.5	5.1	6.2	6.3	5.3	5.1	7.6	10.9
Columbus, Ohio	do	22	3.5	3.4	3.1	2.9	2.7	2.9	3.1	3.3	4.3	4.7	4.5	3.8	3.0	5.0	11.6
Chillicothe, Ohio	do	16	9.3	10.2	6.8	6.4	5.7	4.5	3.8	4.6	7.4	10.1	12.3	11.2	7.8	6.4	14.2
Kings Mills, Ohio	Little Miami	17	6.8	5.4	5.8	5.0	4.7	4.1	4.5	7.4	6.7	11.2	7.6	6.2	5.6	6.2	20.0
Farmers, Ky	Licking	25	10.1	10.2	18.1	17.1	15.2	10.3	6.4	10.3	7.4	8.8	19.3	15.7	9.4	6.4	12.0
Falmouth, Ky	do	28	11.2	11.0	14.0	12.9	10.7	9.0	11.8	9.5	9.2	20.0	28.2	25.1	16.3	11.8	21.0
Pleasant Hill, Ohio	Stillwater	13	5.5	4.3	4.0	3.4	3.0	2.2	2.0	5.3	5.5	7.9	6.0	4.5	4.0	14.0	15.7
Springfield, Ohio	Mad	11	3.0	2.2	2.2	2.1	2.1	2.1	2.1	3.5	3.5	3.4	3.4	3.4	3.3	6.5	11.1
Brookville, Ind	Whitewater	20	5.3	4.1	3.9	3.2	3.0	2.6	3.3	6.0	7.3	9.0	6.3	5.0	4.4	14.2	22.3
Sidney, Ohio	Miami	12	3.1	2.2	2.0	1.6	1.4	1.3	1.2	2.6	4.1	5.2	4.8	3.1	2.4	8.7	11.8
Piqua, Ohio	do	17	3.9	3.3	2.8	2.5	2.2	2.0	1.8	3.6	4.0	5.8	4.8	3.8	3.1	9.7	12.9
Dayton, Ohio	do	21	4.6	3.7	3.3	2.7	2.2	1.8	1.8	3.2	4.1	7.0	6.2	4.4	3.4	6.2	13.1
Franklin, Ohio	do	16	5.2	4.0	3.7	3.1	2.6	2.1	2.0	3.6	4.8	7.5	7.1	5.1	4.0	6.5	14.3
Middletown, Ohio	do	15	7.3	5.6	5.2	5.0	4.5	3.2	4.0	5.2	7.2	10.4	9.5	7.2	5.4	8.0	16.0
Hamilton, Ohio	do	17	4.8	3.8	3.4	2.8	1.5	1.1	1.1	5.0	6.1	8.4	7.1	5.2	3.5	8.4	15.8
Hazard, Ky	North Fork	20	2.0	4.0	6.0	5.0	4.0	3.0	2.0	1.8	1.6	1.3	1.3	1.6	1.8	2.0	6.0
Jackson, Ky	do	28	7.0	12.0	23.3	11.0	6.8	5.2	4.8	4.4	4.1	3.9	4.4	4.4	4.5	4.4	11.0
Lock No. 14	Kentucky	30	13.0	14.4	20.2	17.4	13.2	11.7	11.2	11.2	10.8	10.5	11.5	11.4	11.3	11.2	14.7
Lock No. 10	do	30	15.1	16.6	19.5	20.8	18.7	14.1	14.6	14.2	13.3	15.4	15.8	14.9	13.9	13.2	16.7
Lock No. 7	do	30	14.6	15.1	19.0	20.2	20.3	15.2	13.1	13.9	12.8	15.0	15.8	14.9	13.7	12.8	15.4
Lock No. 4	do	31	10.2	10.4	14.2	16.6	18.8	12.7	9.4	9.9	9.2	12.5	16.3	11.0	9.9	9.2	10.8
Bowling Green, Ky	Barren	20	13.4	14.0	16.7	19.2	18.2	12.2	8.1	8.1	8.7	10.8	13.1	14.7	13.2	11.5	11.0
Lock No. 6	Green	28	17.0	18.4	19.3	21.2	21.2	18.6	13.3	13.5	15.3	22.0	25.6	27.7	26.5	22.2	21.0
Lock No. 4	do	33	25.8	27.7	29.3	31.7	32.5	31.0	24.4	20.3	20.8	27.2	33.6	34.8	35.1	34.1	33.2
Lock No. 2	do	34	22.4	25.0	26.7	27.8	29.1	30.3	31.5	31.3	30.1	32.0	33.8	34.8	35.5	36.3	37.5
Anderson, Ind	West Fork	8	9.9	8.8	8.4	8.3	8.0	7.9	7.8	8.4	8.8	9.6	9.2	8.6	8.3	10.5	17.4
Noblesville, Ind	do	14	10.6	8.1	7.0	6.3	5.8	5.6	5.5	9.0	10.0	10.3	8.5	7.3	6.5	11.8	16.9
Indianapolis, Ind	do	12	8.8	7.9	6.7	5.8	5.4	4.9	4.9	6.5	8.5	9.1	8.5	6.0	6.1	11.4	15.9
Elliston, Ind	do	18	19.4	20.2	21.2	20.2	15.0	12.6	11.8	18.8	20.3	22.2	23.4	24.1	23.6	23.4	26.7
Edwardsport, Ind	do	12	14.0	15.7	16.5	17.2	17.3	15.8	12.5	13.9	17.2	18.1	18.5	18.6	18.6	19.3	19.5
Seymour, Ind	East Fork	14	9.7	10.8	10.5	8.2	6.5	4.7	4.7	10.9	12.2	15.0	15.6	14.9	12.8	11.2	18.8
Williams, Ind	do	10	3.0	3.8	4.0	4.0	4.0	3.4	2.3	2.7	3.8	5.8	6.7	7.0	8.1	9.3	13.4
Shoals, Ind	do	25	6.9	8.0	8.6	8.4	8.5	8.0	6.6	6.9	7.7	12.7	14.6	15.3	16.3	20.3	26.1
Petersburg, Ind	White	16	8.0	11.4	12.8	13.9	14.3	14.8	14.0	12.0	12.8	16.0	17.8	18.9	19.9	21.4	23.4
Hazleton, Ind	do	16	6.8	10.7	12.9	14.1	14.7	15.1	15.2	14.2	13.4	15.3	16.9	18.0	19.0	20.6	22.7
Bluffton, Ind	Wabash	10	6.5	6.0	5.9	5.7	3.0	2.8	2.4	6.4	7.8	6.9	6.7	6.0	5.8	9.7	11.7
Logansport, Ind	do	17	9.7	8.4	7.1	6.1	5.3	4.6	4.2	8.6	11.6	11.2	9.1	7.6	6.5	7.8	13.4
La Fayette, Ind	do	11	15.2	15.2	13.6	10.3	7.3	6.2	5.0	10.7	16.7	19.0	18.3	15.9	12.3	12.7	17.3
Covington, Ind	do	16	16.2	17.8	18.6	18.0	15.1	12.0	9.4	15.3	18.2	20.5	22.5	22.7	21.3	19.8	20.0
Terre Haute, Ind	do	14	13.1	13.8	14.0	14.6	14.7	14.4	12.1	12.5	15.0	16.4	18.1	18.9	19.2	19.3	20.2
Vincennes, Ind	do	14	6.2	8.8	9.9	10.7	10.9	10.7	10.9	11.9	13.0	13.6	13.9	14.0	14.4	16.0	19.2
Mount Carmel, Ill	do	19	6.5	10.1	12.5	13.7	14.0	14.5	14.7	15.1	15.4	16.2	17.1	17.8	18.4	19.8	21.9
New Harmony, Ind	do	15	4.1	6.2	8.5	9.9	10.5	10.9	11.2	11.4	11.9	12.4	12.9	13.4	13.8	14.7	16.1
New River, Tenn	New	20	8.3	15.1	10.6	6.1	4.9	4.5	4.1	3.9	3.7	3.5	3.4	3.5	7.8	6.7	13.5
Rock Island, Tenn	Caney Fork	30	13.0	21.2	22.0	14.9	10.0	10.0	8.6	7.8	6.1	7.7	8.8	7.2	13.8	12.2	15.9
Williamsburg, Ky	Cumberland	19	10.9	14.8	22.2	21.0	17.6	10.8	4.8	3.8	3.2	3.0	3.0	2.9	4.4	5.6	9.2
Burnside, Ky	do	50	24.4	23.8	54.3	41.5	26.4	18.1	13.0	11.5	9.4	8.3	9.2	10.7	9.6	13.6	20.3
Celina, Tenn	do	28	20.4	29.0	37.9	43.1	43.4	43.7	41.4	32.7	18.7	12.4	12.8	12.1	12.9	13.4	19.8
Carthage, Tenn	do	40	22.6	29.8	41.2	46.7	47.2	44.4	42.2	39.7	33.7	20.7	16.5	16.4	18.6	20.6	23.1
Nashville, Tenn	do	40	26.9	30.3	39.9	43.3	43.3	44.0	45.0	45.3	44.8	43.5	38.6	27.9	24.0	24.2	27.3
Clarksville, Tenn	do	46	30.5	32.5	40.3	44.3	46.3	46.9	47.4	48.2	48.8	49.3	49.7	47.7	42.6	37.9	37.6
Lock F	do	50	32.7	37.0	40.8	44.8	47.7	49.8	51.4	52.7	53.9	55.6	56.7	57.7	57.9	57.2	56.2
Mendota, Va	North Fork	8	3.2	3.9	7.3	5.0	3.5	2.6	2.4	2.2	2.0	1.9	1.9	1.8	2.9	4.1	3.5
Elizabethton, Tenn	Watauga	14	5.5	5.8	8.9	7.1	5.5	5.1	4.6	4.3	4.2	3.6	3.7	3.8	5.7	5.4	5.1
Bluff City, Tenn	South Fork	12	2.9	3.8	6.3	5.1	3.9	3.2	3.0	2.6	2.4	2.3	2.2	2.4	3.9	4.4	3.8

[1] Estimated.
[2] Frozen.

and February 1937 at river stations in the watershed of the Ohio Basin

January—Continued																February												Highest	Date
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12		
5.4	5.3	6.5	7.1	6.9	7.1	11.8	10.0	7.7	10.2	8.2	6.8	5.9	5.4	5.2	4.7	5.1	4.9	4.3	4.0	4.0	3.8	3.9	3.9	5.0	5.8	5.4	4.7	12.0	Jan. 22
5.0	4.2	6.0	7.0	5.5	6.6	9.2	9.5	6.8	9.0	7.9	5.9	4.9	4.3	4.0	3.7	4.0	3.6	3.2	3.2	3.0	2.8	2.7	2.7	3.7	4.6	3.9	3.6	11.0	Do.
8.5	7.8	7.5	7.3	6.0	5.6	7.9	8.1	8.1	10.6	11.4	9.1	7.9	6.1	4.6	3.5	3.3	2.6	2.2	1.9	2.0	1.9	1.8	1.8	3.1	3.3	2.0	2.0	11.4	Jan. 26
9.0	7.4	7.5	7.8	6.7	6.8	8.0	7.8	6.9	10.5	10.4	9.2	7.8	6.5	5.5	4.4	3.7	3.3	2.7	2.2	2.0	2.0	2.0	1.9	3.2	4.8	4.0	3.4	11.2	Jan. 25
14.6	12.6	12.0	12.7	11.4	11.0	14.1	13.2	11.3	17.0	16.8	14.2	12.2	10.2	8.9	7.9	7.4	6.7	6.0	5.3	5.3	5.1	4.8	5.0	6.2	8.7	8.1	6.7	18.0	Do.
15.6	13.2	12.0	13.4	11.5	11.5	16.9	15.3	12.1	19.2	19.2	15.0	12.4	10.0	8.6	7.5	6.8	6.2	5.4	4.7	4.6	4.3	4.3	4.0	4.7	7.4	7.5	6.2	21.2	Do.
25.6	22.8	21.4	23.3	21.3	20.5	26.6	26.2	22.5	28.0	29.9	24.5	22.0	19.6	17.8	16.2	16.2	15.6	14.5	13.9	13.3	13.5	13.5	13.0	13.9	16.0	16.6	15.6	31.2	Do.
26.0	23.3	21.6	25.3	22.0	22.0	29.2	30.2	24.5	29.3	32.7	26.1	22.0	20.1	18.4	17.2	16.6	16.0	15.1	14.4	14.1	14.1	14.0	13.8	14.6	16.7	17.1	16.1	34.2	Do.
24.6	22.3	20.9	23.7	21.3	20.9	26.9	28.0	23.3	26.7	30.7	24.8	21.5	19.2	17.2	16.1	15.6	15.1	14.2	13.4	13.1	13.0	12.9	12.5	13.5	15.4	16.0	15.0	31.6	Do.
24.8	22.5	21.0	24.0	21.4	21.1	27.4	29.6	24.0	26.7	32.0	25.5	21.7	19.6	17.8	16.8	16.3	15.8	15.0	14.2	13.8	13.7	13.5	13.4	14.1	15.9	16.7	15.8	32.8	Do.
8.0	5.0	6.5	8.5	5.5	10.1	6.5	6.9	7.1	5.8	7.0	4.8	3.8	3.3	3.0	3.0	3.1	3.1	3.0	2.9	2.8	2.7	2.7	3.6	4.9	7.5	5.0	3.8	10.1	Jan. 21
11.1	9.1	9.9	12.8	10.1	13.2	11.9	14.7	12.8	12.8	12.8	9.2	7.1	6.1	5.4	5.0	5.0	5.0	4.8	4.5	4.3	4.0	4.0	8.2	12.2	13.5	10.1	7.2	14.7	Jan. 23
6.4	2.5	7.2	6.2	3.2	7.1	5.2	15.1	8.2	11.3	6.5	2.4	1.6	1.6	1.5	1.5	1.6	1.4	1.2	1.0	1.0	.8	.8	16.0	11.2	8.6	2.7	1.7	15.9	Do.
4.9	4.3	6.7	6.8	5.5	6.6	9.0	9.4	6.8	9.0	7.6	5.7	4.9	4.5	4.2	3.8	4.3	4.0	3.8	3.7	3.5	3.2	3.0	2.8	6.0	6.2	5.0	4.6	9.4	Jan. 11
5.5	4.7	7.4	8.2	6.4	7.6	10.7	10.5	8.2	10.0	8.8	6.7	5.5	4.8	4.5	4.1	4.6	4.4	4.0	3.6	3.7	4.4	3.1	3.2	6.7	7.0	5.7	4.8	11.9	Jan. 10
4.7	3.8	4.9	9.4	6.1	7.1	12.1	12.3	9.1	11.1	10.5	6.7	4.9	3.9	3.3	2.9	3.2	3.2	2.4	2.0	1.9	1.9	1.8	1.6	5.1	6.2	5.0	3.7	13.4	Jan. 11
13.1	12.6	16.3	17.7	13.6	15.6	15.8	21.3	18.3	20.0	17.4	13.2	10.9	10.0	9.6	9.3	9.2	9.2	9.1	8.8	8.6	8.6	8.5	9.2	18.5	18.0	14.0	11.1	21.8	Jan. 23
13.4	13.3	15.8	18.0	14.0	15.4	16.2	20.4	18.6	20.6	17.8	14.5	11.4	10.4	9.8	9.6	9.5	9.5	9.3	9.1	9.0	8.9	8.8	9.2	18.5	18.0	14.3	11.4	21.6	Do.
17.6	17.0	21.5	26.9	20.8	25.1	25.8	29.6	26.8	30.0	26.5	20.5	17.3	16.2	13.9	13.0	12.8	12.6	12.4	12.4	12.1	12.2	11.8	13.9	26.0	26.4	21.1	17.5	30.9	Do.
18.3	18.6	19.2	27.3	22.0	22.4	26.3	27.5	27.8	28.8	28.1	21.6	18.1	16.5	15.6	15.0	13.2	13.2	13.2	13.4	13.2	13.4	12.4	12.2	23.6	25.3	22.0	18.0	30.0	Jan. 25
7.3	7.3	7.7	13.4	9.8	9.8	13.7	15.5	14.3	14.7	16.3	10.1	7.3	6.1	5.6	5.1	4.2	4.4	4.0	4.0	3.9	4.0	4.0	3.2	8.7	11.1	9.3	6.8	17.0	Do.
10.6	9.3	8.4	8.9	8.3	8.8	12.0	12.3	10.2	13.4	12.4	10.6	8.6	6.8	6.4	6.1	6.4	5.9	5.7	5.5	5.4	5.3	5.3	5.1	5.8	6.4	5.9	5.6	13.8	Do.
----	12.2	11.0	16.2	10.1	10.1	----	----	15.8	----	----	16.5	11.0	6.9	5.6	5.1	5.5	5.1	4.0	3.1	3.0	3.0	2.4	2.1	4.1	4.4	2.4	2.1	----	----
14.8	17.4	16.7	15.6	15.3	14.7	15.9	18.0	19.5	19.3	20.2	20.2	17.9	15.6	12.7	10.6	10.4	9.7	8.5	8.0	7.6	7.3	7.0	7.0	7.5	9.1	8.3	7.3	20.6	Jan. 26
16.8	17.1	17.1	17.2	16.0	14.8	17.9	20.6	21.2	22.9	23.2	22.9	20.1	15.5	12.2	9.2	8.2	7.4	6.9	5.6	4.9	4.8	4.6	4.4	4.9	6.7	6.8	6.3	23.3	Jan. 25
25.9	24.2	25.5	27.1	25.0	25.8	30.1	33.0	30.4	35.1	37.0	33.5	31.6	28.2	23.8	20.2	18.2	16.6	14.0	12.9	12.4	11.7	11.3	11.1	11.6	13.2	13.0	11.9	37.6	Jan. 26
25.1	23.8	24.5	26.1	24.7	25.0	29.0	31.8	30.4	33.5	----	33.5	31.5	28.7	24.2	20.4	17.9	16.3	13.9	12.5	11.6	11.0	10.6	10.4	11.3	12.2	12.5	11.4	[1] 36.0	Do.
29.9	33.3	34.9	37.5	38.2	38.9	40.4	46.7	50.5	53.2	54.7	54.8	52.5	47.3	43.0	31.1	23.4	19.7	17.2	15.2	12.0	13.0	12.7	12.7	16.4	18.2	21.4	21.8	55.0	Do.
11.8	7.7	15.3	12.1	7.5	14.4	10.0	25.0	16.0	18.8	13.4	6.5	5.1	4.8	4.7	4.2	4.5	4.2	3.9	3.5	3.4	3.2	3.0	18.0	15.0	16.5	7.2	5.3	25.1	Jan. 23
11.6	8.8	13.1	17.7	11.2	15.3	13.5	20.2	20.9	22.3	18.1	10.1	6.2	5.3	5.2	5.0	5.0	5.2	4.6	4.2	4.1	4.0	3.8	13.5	18.1	18.5	11.7	6.6	22.8	Do.
18.5	16.0	13.6	16.1	14.4	15.0	19.0	22.4	20.2	20.2	21.5	18.3	11.8	8.6	6.2	5.2	7.0	5.8	5.1	4.8	4.7	4.5	4.4	5.0	8.1	7.8	5.4	4.8	22.4	Do.
9.1	7.6	9.6	9.5	8.2	11.0	8.9	8.1	8.4	8.7	9.3	7.6	6.5	6.1	5.4	5.5	5.7	5.6	5.0	4.8	4.6	4.1	3.8	5.4	7.3	9.8	7.9	6.6	11.0	Jan. 21
3.2	2.7	5.4	6.7	8.9	8.3	7.5	5.3	4.4	4.3	3.4	3.3	1.9	3.5	4.7	6.4	4.6	2.9	2.7	2.3	1.9	1.7	1.8	2.4	1.9	3.2	3.4	2.5	8.9	Jan. 20
4.3	4.3	6.5	6.7	7.1	11.0	7.7	5.9	5.1	5.0	5.1	4.9	4.0	3.9	3.9	4.0	4.1	4.0	3.7	3.7	3.5	3.3	3.0	3.2	4.1	5.5	5.5	4.2	11.0	Jan. 21
8.8	8.0	7.2	9.8	7.8	10.4	9.1	10.6	8.9	10.2	10.4	7.2	5.4	4.8	4.5	4.2	4.0	4.0	3.7	3.4	3.3	3.2	3.1	3.0	6.2	11.4	8.0	5.8	12.8	Jan. 25
8.0	7.7	11.0	12.8	10.9	19.0	15.5	11.3	9.8	9.5	10.4	9.7	7.7	7.0	6.9	6.6	6.6	7.1	6.7	5.9	5.1	5.1	4.2	4.4	5.7	12.2	10.5	8.5	19.0	Jan. 21
13.7	13.6	17.2	19.2	17.4	26.7	23.2	17.8	16.1	16.0	17.7	15.9	13.0	11.9	11.8	12.6	11.8	12.6	12.4	11.6	10.5	10.3	10.1	10.4	11.6	18.4	17.0	14.2	26.7	Do.
6.9	5.0	7.8	8.8	5.8	10.8	6.1	5.3	5.2	8.6	8.2	5.3	4.2	3.8	3.6	3.4	3.4	3.5	3.4	3.4	3.2	3.2	3.0	3.0	4.3	10.0	5.8	4.5	12.5	Feb. 10
10.0	6.6	14.0	12.9	11.6	13.7	11.0	15.3	13.3	15.1	14.0	7.8	5.9	5.1	4.5	4.1	4.2	3.8	3.5	3.3	3.2	3.0	2.9	4.8	11.0	11.5	7.4	5.6	15.3	Jan. 23
13.4	8.8	14.2	17.3	10.0	14.8	11.9	10.3	9.8	13.4	16.0	10.2	7.9	6.8	6.2	5.8	5.6	5.3	5.7	5.3	5.1	4.7	4.4	4.4	7.2	19.0	10.9	8.2	21.0	Feb. 10
18.1	8.2	17.7	28.0	11.9	11.8	12.8	10.6	11.6	15.1	22.0	9.6	6.1	4.9	4.6	4.5	4.2	4.2	4.0	3.6	3.3	3.1	3.0	2.4	6.3	26.1	10.5	6.3	30.3	Feb. 9
18.9	19.1	18.7	27.2	28.5	23.9	21.2	21.3	20.4	22.5	28.6	24.2	12.9	9.4	8.2	7.6	7.4	7.4	7.2	6.7	6.5	6.0	5.5	5.4	7.3	26.5	25.3	13.2	30.3	Jan. 19
20.5	25.5	27.0	34.5	38.5	37.5	36.8	37.3	39.3	41.0	44.8	45.4	42.2	40.0	37.5	34.4	29.9	23.5	16.2	10.5	9.0	8.7	8.4	8.3	9.8	24.5	30.5	24.3	45.4	Jan. 27
8.6	5.0	8.9	6.4	4.6	9.2	11.6	8.1	5.4	11.1	8.9	6.6	3.1	2.8	2.5	2.3	2.4	1.8	1.5	1.2	.8	1.7	2.0	1.4	1.5	2.2	1.9	1.7	13.1	Jan. 15
12.0	10.4	10.4	11.4	9.4	11.0	12.7	11.3	9.8	12.9	11.6	9.6	8.1	7.2	7.0	8.7	9.7	6.9	6.1	5.2	5.0	5.0	4.0	4.0	9.0	9.6	7.3	5.0	13.9	Do.
12.9	12.7	11.8	10.7	10.6	11.0	12.6	13.3	12.0	11.7	12.0	11.6	9.9	7.3	6.2	6.4	6.8	6.3	6.0	5.2	4.9	4.6	4.6	4.6	6.1	7.1	6.8	5.9	13.3	Jan. 23
9.0	6.1	8.3	6.9	5.5	8.5	11.5	8.2	6.1	9.3	8.4	5.8	4.8	4.0	3.6	3.4	4.0	3.5	3.0	2.8	2.8	2.7	2.6	2.6	2.9	4.0	3.8	3.6	12.3	Jan. 15
21.0	23.4	17.8	18.0	20.6	17.5	20.9	27.7	23.6	22.0	24.7	23.0	16.9	13.1	9.6	8.3	8.9	9.1	7.7	6.7	6.1	5.5	5.1	5.1	5.7	7.8	8.3	6.7	27.9	Jan. 23
12.6	7.0	19.6	12.6	11.6	19.2	24.5	14.0	13.6	23.7	13.7	7.2	5.9	5.8	5.7	5.6	5.6	5.3	5.1	5.0	4.8	4.7	4.7	4.6	8.0	5.9	5.3	5.1	24.8	Jan. 22
19.3	17.4	21.8	23.5	22.7	22.6	23.4	24.8	25.3	26.0	24.2	21.8	18.4	12.3	6.3	5.8	5.7	5.6	5.2	5.0	5.0	4.8	4.1	4.8	11.6	14.7	11.2	10.6	26.2	Jan. 25
17.1	14.9	22.3	24.3	22.3	23.3	38.5	[1]40.9	36.1	[1]40.4	39.0	32.3	25.7	21.3	17.5	12.0	7.1	6.2	5.5	4.7	4.2	3.9	3.6	12.7	12.1	14.0	12.2	9.2	41.4	Jan. 23
11.8	7.0	11.0	9.8	5.6	13.5	13.3	9.0	6.0	10.9	8.8	5.8	4.9	4.5	5.0	7.8	6.8	4.5	4.0	3.8	3.4	3.0	2.9	2.9	8.4	5.5	4.0	3.1	17.5	Jan. 15
6.0	3.8	10.5	6.5	4.0	13.2	9.1	7.4	5.4	14.1	7.5	4.4	3.8	3.5	3.5	3.4	2.9	2.8	2.7	2.6	2.6	2.5	2.5	2.5	3.0	3.0	3.0	3.0	14.1	Jan. 25
8.7	6.5	16.6	8.9	6.2	22.1	18.7	8.1	6.9	14.0	8.4	6.4	5.8	5.6	6.2	6.8	6.6	5.0	4.6	4.3	4.0	3.8	3.7	3.7	7.9	5.5	4.3	4.1	22.8	Jan. 15
8.9	7.3	9.2	7.9	6.2	11.4	10.6	9.5	7.2	10.0	8.2	6.6	5.2	4.2	4.6	5.7	5.8	4.1	3.7	2.6	2.5	2.3	2.3	2.3	4.5	4.2	3.7	3.2	11.8	Do.
10.3	8.6	9.6	8.0	6.5	12.0	11.5	9.4	7.4	10.3	8.8	6.8	5.7	4.8	4.4	5.4	5.3	4.3	3.7	3.2	3.0	2.7	2.7	2.7	6.3	5.1	4.3	3.5	12.9	Do.
12.9	9.9	10.2	11.3	8.6	10.6	14.2	12.9	9.7	11.2	12.3	9.1	7.7	6.8	6.0	6.7	6.4	5.2	4.0	3.6	3.3	3.0	3.0	2.8	5.3	6.1	4.3	3.6	14.6	Jan. 22
15.3	12.2	13.8	13.3	10.2	14.6	16.7	15.1	11.9	13.2	14.4	11.1	8.9	7.7	6.7	5.6	6.9	5.9	4.5	4.0	3.7	3.4	3.2	3.1	4.2	6.6	4.9	4.1	16.7	Do.
16.7	14.7	15.8	15.0	12.4	16.0	17.5	16.5	14.6	15.5	15.8	13.4	11.2	10.0	9.1	8.2	9.1	8.0	6.5	5.8	5.4	5.0	4.8	4.7	6.8	8.5	6.8	5.8	17.5	Do.
15.2	13.2	16.2	12.7	10.4	16.8	17.3	15.8	13.4	16.5	14.5	11.6	8.9	7.6	7.0	6.3	6.6	5.8	4.3	3.7	3.4	2.9	2.8	2.7	4.7	6.3	4.8	3.6	17.3	Do.
5.0	5.0	6.0	6.0	4.6	5.0	4.3	5.0	5.0	13.0	6.0	5.0	4.8	4.5	4.0	4.0	4.0	3.8	3.6	3.0	2.8	2.6	2.3	2.0	13.0	6.0	4.0	3.6	13.0	Jan. 25
20.0	11.0	17.0	22.1	17.0	20.0	16.6	15.6	19.2	21.1	24.3	12.0	8.3	7.0	6.2	5.7	5.4	5.0	4.6	4.3	4.2	3.9	3.7	3.9	8.4	24.0	12.2	8.0	26.0	Do.
18.7	17.0	18.1	20.3	19.4	20.3	18.8	17.5	19.8	18.8	21.2	17.8	13.9	12.7	12.7	12.2	12.0	11.6	11.4	11.1	10.8	10.6	10.4	10.4	12.5	18.2	17.9	13.9	21.2	Jan. 26
18.7	19.8	22.9	23.0	23.5	25.6	28.4	30.6	29.6	30.1	27.0	24.5	20.3	15.3	14.4	14.1	14.0	13.7	13.2	12.8	12.5	12.1	11.9	11.8	14.4	16.6	18.8	18.0	30.6	Jan. 23
18.3	19.2	27.4	29.5	26.9	30.4	38.5	42.0	38.6	41.9	35.4	30.0	25.8	16.9	14.2	13.9	13.7	13.0	12.6	12.1	11.8	11.5	11.1	10.8	13.0	15.1	17.4	18.4	42.2	Do.
14.6	16.0	26.8	33.9	31.6	35.2	44.1	46.1	45.3	47.6	45.0	40.2	36.2	30.7	19.5	14.6	12.8	10.9	9.1	8.7	8.5	8.3	8.0	8.2	8.7	10.5	11.9	14.4	47.6	Jan. 25
17.3	18.0	22.6	34.2	36.8	35.0	38.3	40.5	40.0	38.2	35.8	32.0	27.4	21.9	19.1	16.7	15.4	14.6	12.6	11.2	10.7	9.8	9.2	8.8	9.0	9.3	9.4	9.0	40.7	Jan. 23
22.4	25.2	36.0	39.6	43.4	47.0	51.5	53.0	54.5	54.2	51.2	48.0	43.7	38.6	31.6	25.5	21.6	19.2	16.6	14.8	13.6	12.9	12.3	11.8	13.3	13.9	14.4	13.6	54.7	Jan. 24
34.1	35.4	41.3	44.6	48.0	50.9	55.0	57.7	58.0	58.8	57.2	54.9	52.5	49.9	47.1	44.5	42.0	39.6	37.1	34.4	31.9	29.4	27.4	25.8	25.7	25.5	25.3	24.3	59.0	Do.
38.1	38.5	39.7	40.4	41.0	42.3	43.9	45.2	47.2	49.7	51.4	52.7	53.6	54.1	54.4	54.4	54.2	53.9	53.4	52.8	52.2	51.5	50.8	50.2	49.4	48.7	47.9	47.3	54.4	Jan. 30
15.3	10.0	9.6	10.9	9.4	10.3	13.0	11.2	9.0	9.9	10.3	9.2	8.8	8.6	8.8	9.6	10.0	8.9	8.5	8.3	8.2	8.1	8.1	8.1	10.4	11.2	8.9	8.6	18.6	Jan. 15
18.8	14.3	9.4	10.1	9.5	10.9	12.7	13.2	8.9	8.6	10.0	8.3	7.1	6.6	6.6	8.9	10.4	8.2	6.8	6.3	6.1	5.9	5.8	5.8	8.0	11.1	7.9	6.7	18.8	Jan. 16
16.7	15.1	9.8	7.9	7.8	9.1	10.4	10.5	9.2	7.9	8.4	8.0	6.6	5.1	6.0	7.5	9.3	8.3	6.5	5.6	5.4	5.1	5.0	5.0	8.5	9.5	8.6	6.5	16.8	Do.
28.3	30.1	30.1	29.2	27.6	26.4	25.7	26.0	26.5	25.8	24.8	23.6	21.6	19.6	18.2	18.3	19.0	20.0	19.8	18.0	16.6	13.2	12.5	12.0	16.2	18.5	19.9	19.8	30.2	Jan. 17
19.8	20.0	20.7	20.8	20.4	20.2	20.1	19.6	19.5	19.5	19.5	19.2	18.8	18.4	18.1	17.6	17.3	17.1	17.4	17.5	17.0	15.3	12.6	11.3	12.2	14.7	16.1	17.0	20.8	Jan. 18
19.4	17.9	16.8	16.9	15.9	16.5	19.0	16.3	15.5	17.1	17.0	15.6	14.0	11.9	11.3	11.4	12.6	12.5	10.7	8.3	7.4	6.8	6.4	6.2	9.4	12.1	12.9	11.1	19.5	Jan. 16
15.0	19.7	23.5	23.2	21.7	21.7	21.8	22.7	24.4	25.0	23.5	22.5	21.5	20.3	18.0	15.7	13.7	11.3	9.6	8.0	7.0	5.1	3.7	2.5	3.0	3.7	4.3	4.7	25.0	Jan. 25
27.6	28.5	33.4	35.6	35.0	34.7	35.3	34.7	35.6	37.1	36.6	35.3	34.2	33.0	31.3	29.3	27.5	25.7	23.6	21.0	17.4	13.2	9.2	7.0	7.3	8.3	8.9	9.4	37.2	Do.
24.0	24.9	25.9	26.9	27.6	28.0	28.0	27.6	27.0	27.0	27.1	26.9	26.5	25.8	25.2	24.7	24.0	23.3	22.9	22.5	22.1	21.6	20.0	17.5	15.6	15.0	15.0	15.6	28.1	Jan. 21
24.7	25.9	27.4	29.0	30.4	31.3	31.5	31.2	30.4	30.0	29.9	29.7	29.2	28.2	27.4	26.7	26.0	25.1	24.3	23.7	23.3	22.8	22.2	20.9	18.9	17.3	16.5	16.5	31.6	Jan. 22
14.8	13.8	11.6	10.0	8.9	9.8	8.7	9.4	9.0	9.1	7.8	7.7	7.1	4.8	4.4	6.9	6.4	6.1	6.7	6.4	[3]	[3]	[3]	3.1	6.0	6.5	7.5	7.4	14.9	Jan. 16
15.1	14.1	12.4	10.1	8.5	8.3	10.1	9.5	8.3	7.6	8.1	7.5	6.4	5.8	5.2	5.6	9.2	8.0	6.4	5.7	5.0	4.6	4.3	4.2	7.9	8.4	7.9	6.5	15.1	Do.
20.5	21.2	20.3	18.5	15.9	13.6	14.8	15.5	14.4	12.3	11.2	11.2	9.6	8.0	7.3	7.5	11.7	13.4	10.7	7.8	6.6	5.6	5.6	4.8	8.8	12.7	12.0	9.9	21.2	Jan. 17
21.5	24.3	25.3	24.8	23.2	21.4	19.6	19.0	19.2	18.9	17.2	15.1	15.0	13.1	11.4	11.8	14.0	16.0	16.4	14.2	13.5	11.2	9.6	8.1	11.0	14.6	15.9	15.4	25.3	Jan. 18
21.0	21.1	20.7	20.7	21.9	20.7	20.3	19.0	18.2	17.6	17.0	16.5	15.8	14.8	13.7	13.4	14.3	15.3	14.3	14.2	13.5	13.5	11.1	8.0	11.2	13.0	13.3	13.3	21.3	Jan. 16
21.0	21.9	22.1	22.3	21.9	22.3	22.7	22.7	21.8	21.3	20.4	18.8	18.4	17.5	16.8	16.2	15.9	15.2	14.4	13.9	13.9	13.0	12.5	10.9	9.8	11.6	12.0	12.0	22.8	Jan. 22
23.1	23.8	24.6	25.4	26.1	26.7	26.9	27.0	26.8	26.4	26.3	26.2	26.0	25.6	25.2	24.8	24.4	23.8	23.3	22.7	22.2	22.2	21.3	20.2	19.1	18.0	17.4	17.1	27.0	Jan. 23
17.2	18.3	19.8	20.8	21.8	22.9	23.6	23.8	23.8	23.8	23.7	23.8	24.0	24.3	24.3	24.4	24.3	24.1	23.9	23.6	23.1	22.1	21.9	21.2	20.2	18.8	17.5	16.4	24.4	Jan. 30
7.9	7.1	11.6	7.9	6.8	6.1	5.5	6.4	7.8	19.4	8.9	6.2	5.7	6.2	5.6	5.4	5.1	4.8	4.6	4.3	4.3	4.1	4.2	5.1	14.1	8.7	5.9	5.1	26.6	Jan. 2
14.9	12.4	13.8	14.4	13.2	13.1	12.1	12.3	12.7	19.8	16.0	12.3	9.9	10.0	9.8	8.7	10.9	8.4	6.2	7.7	5.6	5.3	6.0	6.6	13.7	14.8	11.2	9.8	22.0	Jan. 3
17.7	16.3	19.4	21.1	20.3	20.3	17.5	15.2	17.2	19.2	22.1	19.1	17.1	10.4	7.7	7.0	8.1	8.1	6.8	5.6	5.6	9.7	7.7	5.4	10.0	19.3	18.3	16.0	22.2	Do.
38.4	28.9	42.5	47.1	39.1	43.3	41.3	36.3	41.8	38.1	44.0	32.2	23.5	20.3	17.2	14.2	14.6	15.0	13.1	11.2	11.2	13.8	11.8	7.7	13.8	32.6	25.2	20.0	54.3	Do.
29.8	35.0	43.0	46.6	47.7	50.5	52.2	53.0	53.6	53.0	52.2	50.4	48.7	47.4	43.6	35.1	26.0	19.5	17.7	16.1	16.1	16.2	10.2	10.0	14.3	24.1	29.9	30.8	53.6	Jan. 24
30.8	35.6	41.4	44.0	46.0	48.2	50.1	51.2	52.4	53.5	54.3	54.4	52.2	50.1	47.8	45.1	41.0	33.2	23.8	19.2	18.1	16.2	15.5	15.4	21.9	26.3	29.9	29.7	54.6	Jan. 26
33.4	34.8	41.6	45.7	47.0	49.2	50.3	51.8	53.2	53.3	53.8	53.5	53.3	53.3	53.0	52.1	51.2	49.7	47.5	43.2	34.2	24.8	18.5	16.2	17.6	29.0	30.2	31.9	53.8	Do.
40.3	41.8	49.6	53.9	55.1	58.1	61.6	64.7	64.8	65.5	64.2	62.9	61.6	60.8	60.2	59.5	58.9	58.0	56.8	55.3	52.5	48.0	41.6	36.0	32.4	34.9	37.3	38.0	65.6	Jan. 25
55.0	54.8	56.8	58.9	61.0	64.1	69.1	72.2	74.0	76.8	76.9	76.6	76.0	75.3	74.7	74.3	73.8	73.3	72.9	72.3	71.7	70.7	69.2	67.3	65.1	62.8	61.2	60.4	76.9	Jan. 26
5.2	3.9	5.4	6.9	5.3	7.9	5.4	4.2	3.8	5.3	6.2	4.3	3.8	3.5	3.3	3.2	3.6	3.5	3.0	2.7	2.5	2.3	2.3	3.2	4.9	8.4	5.0	3.8	8.7	Feb. 9
5.7	5.1	5.7	5.7	8.1	6.5	5.7	5.1	4.7	4.7	4.7	4.5	4.1	5.2	4.8	4.8	5.4	5.1	4.7	4.5	4.3	4.1	4.2	5.3	5.6	7.2	5.9	5.1	8.9	Jan. 3
5.2	3.9	5.2	5.6	6.8	6.6	6.3	4.7	3.8	4.3	5.1	4.6	3.7	4.4	3.9	3.5	3.9	3.8	3.7	3.4	3.2	2.9	2.8	4.6	4.7	7.6	5.6	4.7	7.6	Feb. 10

TABLE 11.—*Daily river gage readings (in feet and tenths) during January and*

Station	River	Flood stage	January 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Rogersville, Tenn	Holston	13	3.4	4.4	8.4	9.0	5.7	4.3	3.7	3.1	2.8	2.5	2.2	2.5	4.5	5.5	5.4
Embreeville, Tenn	Nolichucky	8	3.7	4.0	6.2	4.3	3.5	3.2	2.9	2.9	2.6	2.4	2.4	2.4	3.4	3.1	2.8
Asheville, N. C	French Broad	6	5.9	6.7	8.3	7.1	6.3	5.9	5.0	4.6	4.3	4.3	3.8	3.7	3.8	3.5	3.6
Hot Springs, N. C	do	14	7.6	9.4	12.5	9.6	8.6	7.8	6.9	6.3	5.9	5.5	5.2	5.0	6.6	5.5	5.2
Dandridge, Tenn	do	12	5.6	6.8	13.7	13.1	8.7	6.9	5.8	4.9	4.4	4.0	3.4	3.6	6.4	6.2	5.5
McGhee, Tenn	Little Tennessee	18	11.6	9.5	18.6	15.6	10.1	9.0	8.2	7.6	6.7	6.7	5.7	6.7	11.9	8.6	8.7
Clinton, Tenn	Clinch	25	3.5	6.4	7.5	4.2	3.3	3.0	2.6	2.7	2.6	2.5	2.4	2.4	4.2	3.6	4.6
Charleston, Tenn	Hiwassee	22	11.4	10.3	20.0	21.8	15.2	10.8	8.8	7.6	7.1	6.5	5.7	6.4	9.8	9.6	9.4
Knoxville, Tenn	Tennessee	20	5.8	7.7	15.5	19.0	15.5	9.8	7.5	6.3	5.2	4.6	4.0	4.3	8.0	8.8	8.9
Loudon, Tenn	do	22	9.6	9.8	17.1	21.2	18.9	13.2	10.8	9.1	8.0	7.4	6.9	6.7	10.3	12.0	10.8
Kingston, Tenn	do	26	10.0	11.0	19.4	20.3	17.7	13.3	10.5	9.0	8.0	7.0	7.0	6.9	10.0	12.3	11.5
Breedenton, Tenn	do	28	11.5	13.6	21.8	23.1	22.0	17.8	13.4	11.2	9.8	8.7	8.1	7.7	9.7	14.1	14.2
Chattanooga, Tenn	do	30	16.8	19.5	28.8	32.4	32.9	30.2	24.5	19.1	16.1	14.2	13.0	12.4	13.6	17.8	20.5
Hales Bar Lock, Tenn.:																	
Upper gage	do	50	44.2	45.7	48.5	49.3	49.4	48.5	46.6	44.3	43.0	42.1	41.5	41.4	41.6	43.4	44.7
Lower gage	do	30	13.6	16.5	24.6	28.3	28.9	27.7	23.6	18.0	14.2	13.0	11.1	10.3	11.1	14.3	17.5
Bridgeport, Ala	do	18	11.6	13.6	20.1	23.0	23.7	23.3	20.8	16.1	12.3	10.8	10.0	9.4	10.0	11.8	14.4
Widows Bar Lock, Ala.:																	
Upper gage	do	17	14.0	15.5	21.5	23.9	24.8	24.5	22.3	18.1	14.4	13.2	12.6	12.1	12.6	14.0	15.9
Lower gage	do	26	17.9	20.9	29.0	31.7	32.8	32.5	30.0	25.4	20.0	17.0	15.6	14.6	15.4	18.0	21.5
Guntersville, Ala	do	25	15.8	19.4	26.8	29.4	30.8	31.8	32.0	30.6	27.0	22.0	17.8	15.0	15.5	15.7	19.5
Decatur, Ala	do	25	19.0	20.0	21.4	22.0	22.6	23.0	23.2	23.2	23.2	22.6	20.4	19.0	17.4	17.0	17.8
Florence, Ala	do	18	8.7	11.0	18.0	19.1	19.2	19.6	19.5	18.7	17.4	17.2	15.1	12.1	13.1	11.2	12.5
Riverton, Ala	do	33	21.4	26.4	36.4	38.9	39.8	40.1	40.3	39.8	38.6	38.0	36.6	32.5	31.5	28.9	28.1
Savannah, Tenn	do	39	17.5	23.8	33.3	36.1	38.0	39.0	39.8	40.1	39.9	39.4	38.9	36.6	34.5	22.0	30.0
Johnsonville, Tenn	do	31	14.1	16.6	24.2	27.0	29.6	31.0	31.7	32.0	31.6	31.6	31.7	31.7	31.2	30.3	29.5
Pittsburgh, Pa	Ohio	25	18.7	18.9	19.7	19.6	18.1	16.4	15.2	16.3	18.4	19.0	23.9	22.2	18.9	17.0	18.3
Old Dam No. 2	do	26	14.6	14.8	15.3	15.3	14.3	13.3	12.5	13.1	14.5	14.9	17.9	17.2	14.8	13.6	14.3
Dam No. 7	do	30	19.1	19.5	20.3	20.6	18.6	15.5	13.2	14.2	18.3	20.1	24.0	25.4	20.1	16.9	21.0
Dam No. 12	do	36	18.4	20.0	20.2	21.1	19.9	16.8	14.2	13.5	16.9	19.8	21.6	27.2	23.1	18.2	20.3
Dam No. 13	do	45	20.6	22.3	22.8	23.5	22.5	19.4	16.5	15.2	18.2	22.0	24.2	30.2	26.3	21.1	22.7
Parkersburg, W. Va	do	36	18.0	19.2	21.7	21.4	20.0	18.0	15.3	14.3	14.0	18.0	26.0	26.3	25.9	21.9	22.1
Dam No. 19	do	40	20.0	21.0	23.5	23.7	22.3	20.2	17.4	16.4	16.0	20.0	28.4	28.9	28.5	24.5	24.4
Dam No. 20	do	45	20.9	20.0	23.3	23.7	22.4	20.4	17.5	16.2	15.8	19.4	28.2	29.0	28.8	25.0	24.0
Dam No. 22	do	44	21.2	22.4	25.3	26.4	25.2	22.8	19.6	17.8	17.1	20.4	30.1	31.5	31.3	27.7	26.2
Dam No. 25	do	43	24.8	27.0	31.4	35.0	34.1	30.7	26.8	24.0	22.6	24.0	32.6	35.6	35.6	33.7	31.4
Point Pleasant, W. Va	do	40	21.3	23.7	28.7	32.4	31.2	27.7	23.8	20.9	19.4	21.4	28.8	32.0	31.9	30.1	27.9
Dam No. 26	do	50	27.3	29.7	34.2	38.7	38.0	34.6	30.8	27.7	25.9	26.4	34.7	38.4	38.6	36.9	34.7
Dam No. 28	do	50	23.8	26.6	32.0	37.0	36.7	33.6	29.6	26.6	24.2	23.7	31.4	35.6	36.2	34.9	33.6
Dam No. 29	do	51	26.8	27.7	35.6	40.7	40.8	38.0	33.7	30.4	27.7	26.8	34.6	39.4	40.2	39.0	37.5
Dam No. 30	do	52	26.6	29.4	35.0	39.7	40.6	38.1	34.4	31.3	28.5	27.8	35.1	39.7	40.5	39.3	38.4
Portsmouth, Ohio	do	50	25.0	27.7	32.8	37.2	38.6	36.5	33.0	30.1	27.2	28.0	34.7	38.4	39.0	37.9	38.2
Dam No. 32	do	53	25.0	27.8	32.3	36.8	39.0	38.0	34.8	32.2	29.1	29.4	34.8	38.4	39.8	39.3	40.3
Dam No. 33	do	50	24.6	27.5	31.8	36.2	38.9	38.5	36.2	34.5	30.5	30.8	35.1	38.2	40.2	39.7	41.8
Dam No. 35	do	48	22.2	24.4	27.9	32.0	35.1	36.0	34.7	33.0	30.1	30.8	33.8	36.1	38.2	37.9	43.8
Dam No. 36	do	52	25.7	27.3	31.0	35.1	38.2	39.2	38.1	37.0	33.8	35.1	38.1	40.1	42.0	41.8	48.6
Cincinnati, Ohio	do	52	27.1	28.2	32.0	35.4	38.6	39.6	38.7	37.7	34.6	36.6	39.5	41.3	42.7	42.2	50.0
Dam No. 37	do	50	27.3	28.3	31.4	35.0	37.9	39.0	38.2	38.0	34.9	36.9	39.4	40.9	42.1	42.2	50.8
Dam No. 38	do	51	27.0	27.9	30.7	34.3	37.2	38.7	38.2	38.2	35.3	37.1	39.3	40.5	41.6	41.8	50.4
Dam No. 39	do	48	24.4	25.4	28.0	31.2	34.0	35.6	35.0	34.7	32.7	34.2	36.4	37.4	37.7	37.7	44.9
Louisville, Ky. (upper gage)	do	28	17.1	16.7	17.0	16.7	16.8	17.1	17.3	16.9	16.9	17.0	17.9	19.5	19.9	19.5	24.9
Dam No. 43	do	57	26.4	30.1	31.4	35.1	38.1	40.8	42.4	42.5	41.7	42.3	45.7	47.6	48.2	47.7	52.3
Dam No. 44	do	53	24.9	29.5	31.2	34.2	37.4	40.2	42.2	42.8	41.8	42.5	45.2	47.3	48.2	48.0	52.4
Dam No. 45	do	47	20.6	25.4	27.7	29.8	32.8	35.3	37.6	38.4	37.9	38.8	40.5	41.8	42.8	42.9	45.7
Dam No. 46	do	41	16.5	20.2	23.0	24.7	27.2	29.4	31.5	33.0	33.2	33.9	34.9	35.9	36.7	37.1	38.7
Dam No. 47	do	38	19.7	22.9	26.2	28.2	30.2	32.6	34.9	36.4	36.9	37.6	38.5	39.3	40.1	40.7	42.0
Evansville, Ind	do	35	16.9	20.4	23.8	25.8	27.8	30.0	32.1	33.5	34.1	34.8	35.5	36.7	37.5	38.2	39.6
Dam No. 48	do	38	17.2	20.5	23.9	26.1	28.1	30.2	32.5	34.0	34.9	35.7	36.4	37.3	38.3	39.1	40.6
Dam No. 49	do	37	17.0	19.9	23.5	26.1	27.7	29.5	31.3	32.8	33.9	34.8	35.7	36.4	37.1	37.9	39.6
Shawneetown, Ill.[3]	do	33															
Dam No. 50	do	34	17.4	19.7	23.3	26.3	28.5	30.6	32.8	34.5	36.0	37.5	38.3	39.1	39.8	40.8	42.8
Dam No. 51	do	40	17.3	19.3	22.2	25.3	27.9	30.1	32.3	33.8	35.3	36.8	37.6	38.3	39.0	39.7	41.6
Paducah, Ky.[5]	do	39	17.2	19.1	22.6	26.8	30.0	32.4	34.5	36.0	37.5	39.0	39.8	40.4	40.9	41.4	42.5
Dam No. 52	do	37	18.8	20.6	24.5	28.2	31.5	33.8	35.8	37.6	39.0	40.6	41.4	42.0	42.6	43.2	44.2
Dam No. 53	do	42	22.5	24.3	27.1	31.4	35.0	37.6	39.8	41.7	43.0	44.6	45.5	46.3	46.9	47.6	48.6
Cairo, Ill	do	40	20.6	22.1	24.3	28.0	31.4	34.0	36.1	37.8	39.2	40.8	42.0	42.8	43.4	43.9	45.2

[3] Readings furnished by U. S. Engineer office.
[4] Reading made at 5 p. m.
[5] Readings furnished by U. S. Geological Survey.

February 1937 at river stations in the watershed of the Ohio Basin—Continued

January—Continued																February												Highest	Date
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12		
7.0	5.9	6.8	8.9	8.2	8.8	7.6	5.9	4.9	6.4	7.4	5.8	4.6	4.6	4.8	4.4	5.0	5.0	4.4	3.8	3.5	3.2	3.0	4.8	7.0	10.0	8.7	5.8	10.4	Feb. 10
3.4	2.6	3.1	3.7	4.7	3.9	3.3	3.0	2.7	2.7	2.8	2.6	2.5	3.0	2.9	2.7	3.3	2.9	2.7	2.6	2.5	2.4	2.4	2.5	2.5	3.8	3.1	2.8	6.2	Jan. 3
3.9	3.6	4.0	5.0	6.3	6.1	5.5	4.7	4.5	4.3	4.4	4.0	3.9	4.3	4.0	4.0	4.3	4.0	3.8	3.6	3.5	3.4	3.4	3.3	3.5	5.0	4.5	3.9	8.3	Do.
6.0	5.5	5.7	7.4	9.0	8.0	7.6	6.6	5.9	5.9	6.1	5.6	5.3	5.9	5.6	5.4	6.1	5.8	5.4	5.2	4.9	4.7	4.1	4.1	5.1	7.3	6.5	5.6	12.5	Do.
6.7	5.8	5.7	7.8	10.4	9.4	7.7	6.3	5.2	5.7	6.5	5.6	4.8	4.5	4.9	4.4	5.0	5.0	4.4	4.0	3.4	3.4	3.3	4.3	4.7	8.1	7.3	5.6	15.4	Do.
11.0	8.0	8.4	14.9	13.2	11.0	9.3	8.4	7.9	9.0	11.5	8.9	7.9	7.3	7.3	7.3	9.2	7.8	7.1	6.9	6.6	6.5	6.5	7.5	9.0	14.0	9.8	8.2	20.4	Do.
4.8	3.6	5.6	5.9	4.2	3.9	3.4	3.2	3.8	8.1	5.0	3.8	3.4	3.5	3.1	3.0	9.1	14.1	14.8	14.6	14.6	17.2	17.4	17.8	23.6	5.8	17.0	21.9	23.6	Feb. 9
12.8	10.5	10.3	17.5	16.5	13.6	11.2	9.7	9.0	10.5	14.7	12.0	9.6	8.2	7.4	6.4	7.5	8.4	7.6	7.2	6.6	6.5	6.3	5.8	9.7	15.7	12.2	9.5	21.8	Jan. 4
11.0	9.8	9.7	13.3	14.0	14.4	12.8	10.6	8.3	9.3	12.0	10.1	8.0	6.5	6.8	6.7	7.0	7.7	6.9	5.8	5.1	4.6	4.3	4.9	8.5	13.6	13.4	11.0	19.0	Do.
14.0	12.2	12.0	16.7	16.6	16.5	15.1	13.3	10.9	11.1	14.8	13.0	11.0	9.6	9.1	9.1	10.8	9.8	9.4	8.6	7.9	7.4	7.1	7.8	8.9	15.9	15.2	13.7	21.2	Do.
14.8	13.0	13.7	17.3	17.0	16.4	15.0	13.3	12.0	13.7	16.5	13.9	11.3	10.0	9.2	9.0	9.6	10.9	11.0	10.3	9.8	9.8	9.5	9.2	13.5	18.5	15.5	16.0	20.3	Do.
16.5	16.2	15.5	18.7	19.8	18.8	17.7	16.0	14.7	15.4	18.4	17.3	14.2	12.1	11.0	10.6	10.8	11.9	12.6	12.2	11.3	11.2	11.1	11.0	14.8	19.5	19.3	17.7	23.2	Do.
23.1	24.2	23.2	26.2	28.5	28.4	26.8	24.6	22.2	22.1	26.3	26.8	24.0	20.2	17.4	15.9	16.0	16.5	17.2	17.6	16.8	15.8	15.6	15.5	16.7	24.7	27.7	25.9	33.0	Do.
45.6	46.2	45.9	46.9	47.8	47.8	47.3	46.5	45.6	45.5	47.0	47.3	46.4	44.9	43.7	43.1	43.1	43.0	43.3	43.5	43.2	42.8	42.7	42.6	42.9	46.2	47.4	46.9	49.4	Jan. 5
19.9	20.8	20.4	22.5	24.5	25.1	24.0	22.0	20.0	19.6	22.6	23.9	22.2	18.5	15.2	13.5	13.5	13.7	14.3	14.7	14.3	13.3	13.1	12.9	13.8	20.3	23.7	23.1	28.9	Do.
16.2	17.3	17.0	18.2	19.9	20.6	20.6	18.5	16.5	16.2	18.6	19.7	18.8	16.0	13.2	11.8	11.3	11.6	11.8	12.3	12.2	11.4	11.3	10.9	12.2	16.1	19.1	19.5	23.7	Do.
17.5	18.6	18.6	19.5	21.0	21.9	21.4	20.1	18.2	17.7	19.9	21.0	20.2	17.7	15.1	13.9	13.6	13.8	14.2	14.2	14.2	13.6	13.5	13.5	13.9	17.9	20.2	20.5	24.8	Do.
24.0	25.4	25.5	26.3	28.5	29.4	28.9	27.2	25.2	24.6	26.8	28.7	27.4	24.5	20.9	18.4	17.4	17.8	18.5	18.6	18.6	17.5	17.2	17.1	18.0	23.6	27.1	27.6	32.8	Do.
23.0	24.5	25.5	26.6	27.5	27.5	28.0	28.0	27.0	26.6	28.0	28.4	28.5	28.0	25.3	20.6	18.8	18.6	18.0	18.3	18.4	17.4	16.2	15.5	17.5	21.1	24.3	26.2	32.0	Jan. 6
18.7	21.0	21.4	21.4	21.8	22.0	22.4	22.8	23.2	23.9	23.9	23.6	23.4	23.2	22.7	22.0	21.3	21.0	20.8	20.8	19.7	18.8	16.8	15.3	15.0	16.6	17.9	18.6	23.9	Jan. 25
15.1	15.6	17.1	17.7	17.9	16.7	17.6	17.5	17.8	18.3	19.1	18.8	18.5	17.8	17.4	15.2	13.1	11.4	10.2	9.9	13.2	13.2	13.5	9.4	13.4	13.6	15.2	15.0	20.1	Jan. 4
32.2	33.7	36.2	37.8	38.3	38.6	38.9	39.2	39.7	39.8	40.5	40.9	40.4	39.6	38.8	37.0	34.1	30.3	27.4	24.8	27.8	28.9	29.4	27.0	25.8	29.4	31.1	32.0	40.9	Jan. 27
31.7	33.2	35.5	37.3	38.6	39.8	40.2	40.5	41.4	41.7	41.9	42.2	42.2	41.8	41.2	40.4	38.6	35.4	31.8	28.5	27.4	28.8	29.3	28.7	25.5	28.3	30.1	31.3	42.2	Do.
28.9	29.0	32.5	33.5	34.3	36.6	38.3	40.0	40.3	41.0	40.5	40.1	39.6	39.2	38.9	38.5	38.0	37.6	36.5	35.1	33.5	32.4	31.9	31.5	30.9	30.2	30.4	30.5	41.0	Jan. 25
24.8	23.2	22.0	28.0	24.6	23.5	29.8	32.5	29.2	29.8	34.2	28.0	23.1	20.3	18.3	17.0	15.9	15.5	14.7	13.9	12.2	12.3	12.8	11.6	15.5	20.6	20.3	17.6	34.5	Jan. 26
19.2	17.7	16.8	22.7	19.3	17.9	25.0	28.9	23.9	25.2	30.9	23.9	17.6	15.7	14.4	13.7	13.0	12.8	12.3	11.8	11.6	11.5	11.3	11.3	12.8	15.9	15.8	14.0	31.1	Do.
29.6	27.9	24.7	31.3	29.9	26.3	35.6	42.6	38.1	38.8	44.4	38.0	28.7	22.4	19.0	16.6	15.3	14.6	13.5	12.2	11.5	11.6	11.4	11.0	13.6	21.2	21.5	17.6	44.4	Do.
28.6	30.8	28.2	30.9	34.0	30.5	37.3	45.5	45.0	44.8	47.8	46.6	38.1	28.3	21.9	18.2	16.5	15.0	13.6	12.5	11.1	11.0	11.2	10.4	12.3	18.9	22.2	19.8	48.7	Do.
31.8	34.0	31.7	33.9	37.3	34.1	40.3	48.5	48.6	48.6	51.2	50.6	42.6	32.7	25.6	21.0	19.0	17.1	15.6	14.1	12.2	12.3	12.8	11.6	13.4	20.5	24.6	22.5	52.0	Do.
29.1	32.6	35.0	38.1	38.5	39.4	40.9	46.4	50.6	53.8	55.3	55.2	53.2	48.4	42.0	33.0	24.3	19.1	16.5	13.0	10.5	10.1	10.2	12.0	17.5	18.6	20.4	21.0	55.4	Do.
31.5	35.3	37.6	40.8	41.2	42.2	43.6	49.1	53.2	56.3	57.7	57.9	56.2	52.1	45.5	36.8	27.9	22.1	18.4	15.9	12.7	12.3	12.5	14.6	19.2	21.3	23.0	23.3	58.0	Do.
31.2	33.5	36.0	41.0	41.6	42.6	44.0	49.0	51.4	56.8	58.3	58.3	57.3	53.4	47.4	39.3	30.0	23.1	18.7	16.0	13.1	12.2	12.1	14.7	18.6	21.4	22.5	23.2	58.6	Jan. 27
33.1	37.6	41.1	44.6	45.5	46.8	48.3	53.1	57.1	60.7	62.3	62.5	62.0	58.7	53.4	45.6	36.2	27.8	21.6	17.8	14.3	12.0	12.6	16.4	19.9	23.4	24.7	25.6	62.6	Do.
36.1	40.9	45.0	49.4	51.4	53.1	55.6	58.1	60.5	63.6	65.5	66.6	66.3	64.4	61.0	56.6	49.4	40.7	32.7	26.2	21.7	15.8	16.8	20.5	24.3	30.9	33.7	33.7	66.9	Do.
32.4	37.2	41.6	46.2	48.2	49.9	52.6	54.7	57.5	59.6	61.6	62.7	62.5	60.5	57.2	52.9	45.7	37.0	29.0	22.5	18.0	12.1	15.1	18.8	21.1	28.0	31.2	30.8	62.7	Do.
38.4	43.8	48.0	52.8	55.2	56.7	59.2	61.7	64.0	66.7	68.9	70.1	70.0	68.3	65.7	61.3	55.3	47.1	39.0	32.2	25.7	19.7	22.9	23.1	27.2	33.8	37.7	37.6	70.3	Do.
36.8	41.4	46.6	51.4	54.5	55.9	58.2	61.0	63.3	65.8	67.9	69.1	68.7	67.3	65.2	61.8	56.9	49.8	41.5	33.1	26.2	20.1	16.0	18.0	24.6	31.2	37.4	37.2	69.4	Do.
40.7	45.6	50.3	55.5	58.6	60.2	62.4	65.3	67.8	70.4	72.3	73.4	73.1	71.9	69.8	66.8	62.2	55.2	47.1	38.4	30.8	24.2	19.3	19.0	27.5	34.2	41.2	41.3	73.6	Do.
41.5	45.7	50.6	55.9	58.8	60.4	63.1	66.4	68.8	72.0	73.0	74.4	74.6	73.3	71.2	68.1	64.2	58.1	50.4	41.6	33.4	26.3	20.9	20.2	27.1	33.4	40.2	41.2	74.7	Do.
41.0	44.7	50.0	54.8	57.3	59.3	62.8	66.2	68.8	71.1	73.4	74.1	73.8	72.3	70.1	67.2	63.7	58.9	51.5	42.5	33.7	25.9	19.7	19.0	25.7	31.2	37.4	39.5	74.2	Do.
42.1	44.6	49.5	54.7	57.4	59.9	63.8	68.0	70.2	73.5	74.7	75.3	75.2	74.1	72.2	69.9	66.8	61.8	54.9	46.7	38.2	30.0	23.2	20.8	25.0	30.3	36.7	39.6	75.5	Do.
43.1	44.9	49.6	54.6	57.1	59.8	64.2	67.4	69.4	73.7	74.9	75.3	75.2	74.1	72.3	69.9	67.0	62.9	56.7	49.6	41.3	33.1	25.7	21.6	24.4	30.0	35.6	39.4	75.3	Do.
45.0	44.1	47.7	52.7	54.6	58.2	64.5	67.6	68.8	74.1	75.1	74.9	74.5	73.4	71.7	69.5	66.9	63.2	58.6	52.2	44.8	36.6	28.4	22.1	21.7	26.0	30.8	35.4	75.1	Jan. 26
49.9	48.3	51.9	56.8	58.6	62.5	69.1	72.3	72.9	78.4	79.7	79.3	78.7	77.6	76.3	73.7	71.1	67.6	63.1	56.8	49.3	41.0	32.7	25.7	25.1	29.3	33.9	38.5	79.8	Do.
51.2	49.2	52.4	57.2	58.9	62.7	69.4	72.6	73.4	78.7	80.0	79.6	78.8	77.8	76.1	74.1	71.6	68.3	63.9	58.2	51.2	43.2	34.7	27.8	26.7	30.5	35.0	39.1	80.0	Do.
51.8	49.8	52.7	57.0	58.3	62.3	68.8	72.0	72.9	78.0	78.8	78.3	77.4	76.4	75.0	72.9	69.4	66.3	63.5	58.1	51.5	43.7	35.0	28.2	27.1	30.4	34.5	38.5	78.8	Jan. 25
52.1	50.0	52.5	56.4	57.8	62.0	67.9	70.9	72.0	77.3	78.6	78.2	77.5	76.7	75.3	73.0	70.1	67.3	64.6	59.6	53.4	45.5	36.9	29.0	26.9	29.6	33.3	37.3	78.6	Jan. 26
47.2	46.0	47.9	51.1	52.8	56.7	62.3	66.0	67.2	72.1	73.5	73.2	72.5	71.5	70.0	68.0	65.8	63.4	60.8	56.8	51.2	44.5	36.0	28.6	25.1	26.7	30.0	33.8	73.5	Do.
29.0	30.0	30.8	33.5	35.9	39.1	45.4	49.4	51.5	54.8	56.6	57.1	56.8	56.4	55.4	54.1	52.6	50.7	48.5	45.5	41.4	36.0	28.8	19.7	14.5	16.8	16.9	17.0	57.15	Jan. 27
57.1	58.6	59.3	61.9	64.1	67.2	73.4	76.3	80.9	84.6	86.5	87.0	86.7	86.2	85.1	83.9	82.8	80.8	78.6	75.7	71.7	66.7	60.1	51.4	42.1	35.1	34.1	36.4	87.0	Do.
56.9	58.2	59.3	61.4	63.1	66.3	71.5	76.3	78.4	81.7	83.5	84.1	83.9	83.4	82.8	81.7	80.6	78.9	77.0	74.5	71.4	67.2	60.9	53.9	42.9	37.7	35.4	36.5	84.2	Do.
48.9	50.5	51.8	52.9	54.0	56.8	60.3	62.9	64.6	67.0	68.2	68.7	68.9	68.7	68.3	67.8	67.0	66.0	64.9	63.4	61.3	58.7	55.5	50.5	45.0	38.9	35.0	34.4	68.9	Jan. 28
40.6	42.0	43.1	43.9	44.5	46.0	48.4	50.1	51.1	52.7	53.6	54.2	54.6	54.8	54.8	54.6	54.4	54.0	53.5	52.8	52.0	50.9	49.4	47.3	44.4	40.8	37.5	35.7	54.8	Jan. 29
43.3	44.3	45.2	45.9	46.4	47.5	49.3	50.8	51.9	53.7	54.9	55.6	56.2	56.4	56.5	56.6	56.5	56.2	55.8	55.3	54.7	53.9	52.8	51.3	49.4	47.0	44.3	42.3	56.6	Jan. 31
40.7	41.8	42.8	43.5	44.2	44.9	46.6	48.0	49.4	50.8	52.0	52.6	53.0	53.4	53.6	53.7	53.7	53.6	53.3	52.9	52.4	51.8	50.9	49.8	48.2	46.1	43.9	42.1	53.75	Do.
41.8	43.1	44.6	45.5	46.3	47.5	49.5	51.2	52.6	54.1	55.4	56.4	57.2	57.8	58.2	58.5	58.6	58.5	58.2	57.8	57.3	56.5	55.5	54.4	52.9	51.0	48.5	46.3	58.6	Feb. 1
40.8	42.0	43.7	45.5	47.3	49.4	51.8	54.1	56.0	58.0	59.6	60.9	62.1	63.0	63.7	64.2	64.4	64.4	64.3	64.0	63.5	62.8	62.0	61.0	59.9	58.3	56.1	53.7	64.4	Do.
40.9	42.3	[4]44.9	46.1	48.1	50.4	52.9	55.1	57.9	58.9	60.6	61.9	63.0	64.0	64.6	65.2	65.4	65.5	65.4	65.2	64.7	64.4	63.4	62.4	61.2	60.2	57.4	55.0	65.5	Feb. 2
43.6	44.8	47.0	48.7	50.7	53.4	55.9	57.9	59.9	62.1	63.5	64.7	65.8	66.6	67.4	67.9	68.1	68.2	68.3	68.1	67.8	67.3	66.6	65.7	64.8	63.2	61.3	59.0	68.3	Do.
41.9	42.7	44.7	45.9	47.6	50.3	52.7	54.5	56.3	58.1	59.3	60.2	60.9	61.5	61.9	62.3	62.5	62.6	62.6	62.5	62.2	61.8	61.3	60.6	59.8	58.7	57.2	55.7	62.6	Do.
42.9	43.2	44.7	46.2	47.5	49.9	52.5	54.4	55.8	57.4	58.5	58.9	59.3	59.6	60.0	60.3	60.5	60.6	60.5	60.4	60.1	59.7	59.2	58.6	58.0	57.0	55.9	54.6	60.6	Do.
44.6	45.1	46.3	47.8	49.0	51.4	54.0	55.9	57.2	59.1	60.1	60.6	61.0	61.4	61.7	62.0	62.2	62.3	62.3	62.1	61.9	61.4	60.9	60.4	59.7	58.7	57.5	56.2	62.3	Do.
49.3	49.7	50.8	52.0	53.1	54.9	57.1	59.0	60.4	61.8	62.5	62.6	62.8	63.0	63.4	63.7	63.8	64.0	64.0	63.9	63.7	63.4	63.0	62.7	62.1	61.3	60.5	59.6	64.0	Do.
46.2	46.8	47.8	49.0	49.9	51.5	53.6	55.4	56.7	58.2	58.3	57.9	57.8	58.3	58.7	59.0	59.3	59.4	59.5	59.5	59.4	59.3	59.0	58.5	58.1	57.4	56.6	55.7	59.5	Feb. 3

TABLE 12.—*Daily river gage readings (in feet and tenths) during January and February*

Station	River	Flood stage	January														
			17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Leeper, Mo	Black	11	5.8	5.1	4.4	4.2	4.0	4.9	4.4	4.2	4.0	3.9	3.7	3.7	3.8	4.0	5.1
Black Rock, Ark	do	14	23.4	23.8	24.0	24.1	25.0	25.5	25.7	24.9	24.7	24.2	23.7	23.2	22.9	22.7	22.6
Ozark Beach, Mo	White	30	16.0	10.9	8.5	7.4	6.4	6.0	5.8	5.4	5.6	5.4	5.5	5.6	5.4	6.8	13.0
Batesville, Ark	do	23	27.7	25.8	23.4	18.9	20.3	21.0	19.8	16.4	16.4	15.6	15.2	14.5	14.7	15.4	17.2
Clarendon, Ark	do	26	27.4	28.4	29.2	30.0	30.9	32.0	33.0	33.9	34.7	35.2	35.6	35.7	35.7	35.5	35.3
Fort Smith, Ark	Arkansas	22	21.4	19.8	15.8	13.0	11.3	10.7	12.4	13.0	11.1	10.8	10.6	10.4	10.5	11.5	15.3
Little Rock, Ark	do	23	17.3	18.7	18.2	16.3	15.4	14.4	15.2	14.9	14.9	15.0	14.2	13.4	12.6	11.9	11.3
Arkadelphia, Ark	Ouachita	17	14.9	16.5	13.1	11.5	22.5	25.6	26.0	24.1	21.4	17.4	15.6	12.6	11.9	11.3	10.2
Camden, Ark	do	26	32.5	32.7	32.9	33.3	33.8	34.4	36.3	39.8	41.5	41.4	40.1	38.3	36.5	35.3	33.7
Monroe, La	do	40	28.1	28.7	29.2	29.8	30.4	30.9	31.3	32.1	33.0	33.7	34.6	35.1	36.8	38.1	39.4
Jonesville, La	Black	50	38.2	38.8	39.5	40.5	41.3	41.8	42.9	43.5	44.2	44.7	45.2	45.6	45.9	46.3	46.7
Shreveport, La	Red	39	20.2	21.6	21.9	21.7	21.3	21.4	22.0	22.4	22.7	22.6	22.8	23.0	23.2	23.1	22.8
Alexandria, La	do	32	26.0	26.4	27.4	28.4	29.3	29.7	30.2	30.7	31.3	31.8	32.0	32.2	32.4	32.5	32.7
Manila, Ark	Big Lake Outlet	10	14.9	15.9	16.6	17.4	18.4	19.5	20.4	20.8	20.9	21.2	21.4	21.4	21.3	21.2	21.1
Fisk, Mo	St. Francis	20	25.8	24.8	23.9	23.1	22.3	22.5	22.9	22.9	22.4	21.8	21.1	19.9	19.3	19.4	20.5
St. Francis, Ark	do	18	23.3	25.8	26.6	25.9	25.7	25.1	23.9	23.1	22.6	22.1	21.6	21.1	20.9	20.6	20.6
Marked Tree, Ark	do	17	5.4	8.5	9.7	10.1	11.5	14.1	15.3	15.9	16.7	17.2	17.6	17.9	18.0	18.0	18.1
Parkin, Ark	do	28	16.4	19.9	22.0	23.3	25.6	28.1	29.4	30.2	31.1	31.6	32.2	32.7	33.1	33.4	33.8
Madison, Ark	do	32	21.6	24.0	25.3	26.7	28.8	32.0	31.9	33.2	34.1	34.9	35.6	36.1	36.6	37.0	37.4
Swan Lake, Miss	Tallahatchie	26	30.8	30.9	30.9	30.9	31.0	31.1	31.3	31.6	32.0	32.3	32.6	32.8	33.1	33.4	33.7
Greenwood, Miss	Yazoo	35	27.0	27.8	28.0	28.6	28.8	28.9	30.1	30.3	30.8	31.0	31.5	32.0	32.6	33.3	33.9
Yazoo City, Miss	do	29	25.0	24.4	24.7	24.8	25.1	25.4	26.2	26.9	27.7	28.0	28.5	28.7	29.0	29.3	29.7
St. Louis, Mo	Mississippi	30	12.8	11.2	10.0	9.4	8.5	7.7	7.9	8.7	9.2	8.7	7.7	6.8	6.2	5.9	6.2
Cape Girardeau, Mo	do	32	22.0	23.6	23.5	22.7	23.2	23.9	24.2	24.9	26.1	26.7	26.3	25.8	25.6	25.7	26.2
New Madrid, Mo	do	34	36.9	37.5	38.3	39.2	40.1	41.4	42.7	43.5	44.2	44.4	44.6	45.6	46.7	47.2	47.6
Memphis, Tenn	do	34	31.3	32.3	33.0	33.7	34.7	36.3	38.0	39.5	41.4	42.7	43.7	44.3	44.6	44.9	45.6
Helena, Ark	do	44	39.4	40.2	41.1	42.1	43.1	44.5	46.0	48.0	49.7	51.3	52.8	53.9	54.6	55.2	55.8
Arkansas City, Ark	do	42	30.6	31.4	32.3	33.2	34.2	34.9	35.7	37.1	38.3	39.8	41.7	43.3	44.6	46.1	47.2
Greenville, Miss	do	36	29.4	30.3	31.1	32.0	32.9	33.7	34.6	35.7	36.9	38.2	39.6	41.0	42.4	43.6	44.7
Vicksburg, Miss	do	43	31.1	32.0	32.9	34.0	35.0	35.9	36.9	37.8	38.7	39.6	40.6	41.5	42.4	43.4	44.4
Natchez, Miss	do	48	34.0	34.8	35.8	37.2	38.2	39.0	39.9	40.5	41.8	42.3	43.1	44.0	44.9	45.8	47.3
Angola, La	do	45	31.8	33.0	34.0	35.3	36.2	36.8	37.6	38.4	39.2	40.0	40.6	41.3	42.0	42.8	43.6
Baton Rouge, La	do	35	23.6	24.7	25.6	27.0	27.5	28.2	28.8	29.5	30.4	30.9	31.5	32.0	32.5	33.0	33.7
Donaldsonville, La	do	28	17.3	18.2	19.0	20.4	20.7	21.3	21.9	22.6	23.2	23.7	24.2	24.8	25.3	25.8	26.1
Reserve, La	do	22	12.6	13.3	13.9	15.0	15.2	15.8	16.4	16.9	17.5	17.9	18.4	18.9	19.2	19.6	19.8
New Orleans, La	do	17	9.1	9.6	10.0	10.9	11.1	11.5	12.1	12.5	13.0	13.4	13.7	14.0	14.4	14.6	14.9
Simmesport, La	Atchafalaya	41	26.6	27.4	28.2	29.3	30.2	31.0	31.5	32.1	32.8	33.6	34.4	34.9	35.6	36.2	36.8
Melville, La	do	37	27.3	28.0	28.7	29.6	30.3	30.7	31.2	31.8	32.4	32.9	33.3	33.8	34.3	34.8	35.2
Atchafalaya, La	do	25	20.4	20.8	21.2	21.5	21.8	22.0	22.2	22.4	22.7	22.9	23.0	23.2	23.3	23.4	23.6

1937 at selected river stations in the watershed of the Mississippi Basin

February 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	Highest	Date
5.8	5.0	4.4	4.2	3.8	3.7	3.6	3.6	4.0	4.4	3.8	3.7	3.5	3.3	3.2	3.2	3.2	3.1	3.0	3.0	3.1	3.6	3.5	3.4	3.2	3.1	3.0	2.9	14.1	Jan. 15
22.5	22.1	21.6	21.2	20.8	20.5	19.9	19.4	19.2	18.5	17.9	17.3	16.6	16.0	15.2	14.4	13.3	12.4	11.5	13.4	13.9	14.0	13.6	13.0	12.5	11.9	11.2	10.5	26.2	Jan. 16
14.6	12.3	9.5	8.0	7.1	6.4	5.2	5.5	5.6	5.6	5.7	5.2	4.8	4.6	4.4	4.3	1.0	1.5	2.6	2.2	4.2	4.4	5.4	5.6	5.0	4.6	4.4	4.4	17.7	Do.
20.8	22.5	22.1	19.7	17.0	15.4	14.1	13.3	12.8	12.3	12.1	11.9	11.7	11.3	10.9	10.4	10.0	9.8	9.1	11.8	11.7	12.2	13.2	12.5	12.2	12.1	11.4	10.9	31.5	Jan. 15
35.1	34.8	34.5	34.2	33.9	33.7	33.5	33.4	33.4	33.2	33.1	33.0	32.8	32.6	32.5	32.2	31.9	31.7	31.4	31.3	31.1	30.7	30.4	30.2	29.9	29.6	29.3	29.0	35.7	Jan. 28
19.3	20.8	18.1	14.3	12.5	11.3	10.7	10.6	10.2	9.8	10.2	10.4	10.0	9.7	9.4	9.6	9.1	8.5	8.0	7.7	7.8	8.6	7.8	7.8	9.0	8.4	7.5	7.1	21.8	Jan. 17
11.2	14.7	17.1	17.3	14.7	12.1	10.2	8.9	8.0	7.5	7.0	6.5	6.3	6.4	6.3	5.8	5.6	5.4	5.2	5.3	5.9	5.9	5.7	5.6	5.6	4.9	4.9	5.1	18.8	Jan. 18
9.1	8.6	8.5	8.4	8.3	8.0	7.9	7.3	7.8	7.6	7.0	6.3	7.6	6.6	5.0	7.3	6.6	7.2	7.2	11.2	9.1	7.5	8.1	7.8	7.9	7.4	7.9	7.1	26.0	Jan. 23
32.2	30.7	29.0	26.7	24.3	21.8	19.8	18.6	17.1	16.0	15.3	14.4	13.4	13.0	12.5	11.7	10.9	10.0	9.5	9.2	15.8	18.5	19.9	18.9	18.5	18.0	16.5	15.1	41.5	Jan. 25
40.4	41.3	42.2	43.0	43.5	44.0	44.3	44.5	44.7	44.7	44.6	44.6	44.4	44.2	44.0	43.8	43.6	43.3	43.0	42.8	42.5	42.3	42.0	41.8	41.6	41.2	41.0	40.9	44.7	Feb. 9
47.1	47.5	47.9	48.2	48.6	49.0	49.3	49.6	50.0	50.4	50.6	50.9	51.3	51.6	52.0	52.3	52.6	53.0	53.3	53.6	54.0	54.3	54.5	54.8	55.0	55.1	55.2	55.4	55.8	Mar. 5
22.4	22.0	21.5	21.1	20.5	19.8	18.9	18.1	17.1	16.3	15.6	15.0	14.2	13.9	13.2	12.6	11.9	11.4	10.7	10.8	10.8	11.0	11.6	12.1	12.0	11.5	11.0	10.8	23.2	Jan. 29
32.8	33.0	32.9	32.7	32.3	31.8	31.1	30.4	29.3	28.0	26.6	25.3	24.2	23.2	22.4	21.6	20.8	20.1	19.4	19.0	18.9	18.9	18.9	19.0	19.3	19.4	19.2	19.0	33.0	Feb. 2
20.9	20.7	20.5	20.1	19.7	19.2	18.7	18.2	17.8	17.4	17.0	16.6	16.2	15.9	15.6	15.4	15.1	14.8	14.5	14.3	14.0	13.7	13.4	13.1	12.9	12.6	12.3	12.0	21.4	Jan. 27
22.5	23.1	23.2	22.2	20.8	19.0	17.7	16.8	17.2	19.7	21.2	20.1	19.1	17.0	16.3	15.9	14.8	14.2	13.5	13.1	12.9	13.0	13.6	14.1	13.9	13.5	12.9	12.5	26.2	Jan. 15
20.5	20.4	20.7	20.9	21.1	21.0	20.6	20.3	20.0	19.7	19.4	19.3	19.2	19.1	19.4	19.4	19.2	18.9	18.6	18.4	17.5	16.8	15.9	15.3	14.8	14.6	14.4	14.3	26.7	Jan. 19
18.1	18.2	18.5	18.7	18.8	18.8	18.8	18.8	18.8	18.7	18.6	18.4	18.1	18.0	17.8	17.6	17.3	17.0	16.7	16.5	16.3	15.9	15.6	15.2	14.8	14.3	13.8	13.4	18.8	Feb. 5
34.0	34.2	34.2	34.3	34.3	34.3	34.2	34.2	34.2	34.1	34.0	33.9	33.9	33.8	33.7	33.5	33.3	33.2	33.0	32.8	32.6	32.3	32.0	31.7	31.4	31.1	30.7	30.3	34.3	Feb. 4
37.7	38.0	38.3	38.6	38.9	39.3	39.5	39.9	40.1	40.3	40.4	40.6	40.7	40.5	40.5	40.2	40.1	39.7	39.4	39.1	38.5	38.2	37.8	37.3	36.9	36.4	35.9	35.5	40.7	Feb. 13
33.8	33.9	33.8	33.6	33.3	33.0	32.8	32.5	32.3	32.1	31.8	31.6	31.4	31.2	31.0	30.8	30.7	30.5	30.3	30.2	30.0	29.8	29.6	29.5	29.3	29.1	29.0	28.8	33.9	Feb. 2
34.5	34.9	35.3	35.6	35.8	36.0	36.2	36.2	36.4	36.2	36.1	35.9	35.7	35.6	35.3	35.1	34.7	34.4	34.0	33.6	33.4	33.0	32.6	32.2	31.9	31.5	31.2	31.4	36.4	Feb. 9
30.1	30.5	30.8	31.2	31.6	32.1	32.6	33.0	33.4	34.0	34.3	34.8	35.0	35.4	35.7	36.0	36.1	36.3	36.5	36.6	36.9	37.0	37.0	37.1	37.0	37.0	37.0	37.0	37.1	Feb. 24
7.0	8.9	9.4	10.9	12.2	12.1	10.6	9.1	9.3	10.2	9.8	9.6	9.9	9.9	9.4	9.6	10.9	13.3	14.2	14.7	14.4	14.9	16.6	18.3	18.8	18.6	17.9	16.9	18.8	Feb. 25
26.5	26.5	26.9	27.1	27.2	27.5	27.4	26.8	26.4	25.7	25.1	24.5	23.7	23.2	22.5	21.7	21.2	21.1	21.6	22.2	22.3	22.1	22.0	22.8	24.2	24.9	24.7	23.9	27.5	Feb. 6
47.8	47.9	47.9	47.9	47.9	47.8	47.7	47.5	47.3	46.9	46.4	45.9	45.3	44.6	43.8	43.1	42.3	41.5	40.9	40.2	39.5	38.8	37.8	36.8	35.7	34.7	33.7	32.6	47.9	Feb. 2
46.2	46.7	47.1	47.5	47.8	48.0	48.2	48.4	48.6	48.7	48.5	48.4	48.1	47.8	47.3	46.8	46.0	45.2	44.4	43.5	42.7	41.7	40.8	39.9	39.0	38.0	37.0	35.9	48.7	Feb. 10
56.5	57.1	57.6	58.0	58.3	58.7	59.1	59.4	59.8	60.1	60.2	60.1	60.2	60.2	60.0	59.8	59.5	59.1	58.6	58.1	57.4	56.9	56.2	55.5	54.7	53.8	52.9	51.9	60.21	Feb. 12
48.1	49.0	49.9	50.6	51.3	51.7	52.2	52.6	53.1	53.4	53.7	53.8	53.8	53.8	53.8	53.7	53.5	53.4	53.1	52.7	52.3	51.9	51.5	51.1	50.9	50.3	49.7	49.0	53.8	Do.
45.7	46.8	47.7	48.5	49.2	49.7	50.3	50.7	51.1	51.5	51.8	52.0	52.1	52.1	52.2	52.1	52.0	51.8	51.5	51.4	51.0	50.7	50.4	50.1	49.7	49.2	48.8	48.3	52.2	Feb. 15
45.2	46.0	46.8	47.5	48.3	48.7	49.5	50.1	50.6	50.8	51.3	51.6	52.0	52.2	52.4	52.7	52.6	52.7	52.8	52.9	53.2	53.0	52.9	52.9	52.7	52.5	52.4	52.3	53.2	Feb. 21
48.3	49.0	50.0	50.9	51.7	52.4	53.1	53.8	54.4	55.1	55.5	55.9	56.2	56.5	56.8	57.0	57.3	57.5	57.6	57.8	58.0	58.0	58.0	58.0	58.0	57.9	57.8	57.7	58.0	Do.
44.5	45.3	46.1	47.0	47.8	48.6	49.4	50.0	50.8	51.3	51.9	52.3	52.8	53.2	53.5	53.7	54.0	54.3	54.6	54.8	55.0	55.1	55.2	55.3	55.4	55.4	55.5	55.5	55.5	Feb. 27
34.4	35.1	35.7	36.6	37.4	38.2	39.0	39.6	40.4	40.9	41.4	41.8	42.3	42.7	43.0	43.3	43.5	43.9	44.0	44.3	44.5	44.6	44.7	44.8	44.8	44.9	44.9	44.9	45.0	Feb. 28
26.6	27.3	27.8	28.4	29.0	29.5	30.0	30.6	31.1	31.5	32.0	32.2	32.6	32.7	33.0	33.2	33.4	33.6	33.7	33.8	33.9	34.0	34.1	34.2	34.2	34.3	34.4	34.4	34.5	Feb. 27
20.2	20.6	21.1	21.5	21.9	22.3	22.7	23.1	23.5	23.7	23.9	24.3	24.4	24.6	24.6	24.7	24.8	25.1	25.0	25.1	25.3	25.3	25.3	25.3	25.5	25.6	25.5	25.4	25.6	Feb. 26
15.1	15.4	15.7	16.0	16.3	16.6	16.9	17.2	17.6	17.6	18.0	18.2	18.2	18.4	18.4	18.5	18.5	18.8	18.7	18.8	19.0	19.0	18.9	19.0	19.0	19.1	19.1	19.1	19.3	Feb. 28
37.3	38.2	39.0	39.6	40.4	41.1	41.7	42.3	43.0	43.6	44.2	44.7	45.4	45.8	46.1	46.5	46.7	47.1	47.4	47.7	48.1	48.2	48.4	48.7	48.9	49.0	49.2	49.2	49.3	Mar. 1
35.6	36.3	36.8	37.4	38.0	38.5	39.0	39.5	40.0	40.4	40.8	41.2	41.6	42.0	42.3	42.5	42.7	42.9	43.2	43.5	43.7	44.1	44.2	44.3	44.5	44.6	44.7	44.7	44.8	Mar. 2
23.8	23.9	24.0	24.1	24.2	24.4	24.5	24.6	24.7	24.8	24.9	24.9	25.0	25.0	25.1	25.1	25.1	25.1	25.2	25.3	25.4	25.4	25.5	25.5	25.6	25.7	25.7	25.7	25.9	Mar. 7

TABLE 13.—*Flood crests in Ohio and lower Mississippi Basins* [1]

Distance above mouth	Station	River	Length of record	Flood stage	1937		Mean sea level elevation of 1937 crest	Prior to 1937	
					Highest	Date		Highest	Date
Miles			*Years*	*Feet*	*Feet*		*Feet*	*Feet*	
1.5	Johnstown, Pa.	Stony Creek	47	15	12.0	Jan. 22, 10 a. m.	1,166.0	30.2	Mar. 17, 1936
27	Saltsburg, Pa.	Kiskiminetas	22	16	11.0	Jan. 22, 6 p. m.	836.4	32.9	Mar. 18, 1936
259	Olean, N. Y.	Allegheny	20		11.4	Jan. 26, 8 a. m.	1,414.6	[2] 19.4	June 1, 1889
192	Warren, Pa.	do.	52	12	11.2	Jan. 25	1,182.2	[2] 17.4	Mar. —, 1865
126	Franklin, Pa.	do.	32	17	18.0	Jan. 25, 5 p. m.	974.3	26.0	Feb. 27, 1917
85	Parkers Landing, Pa.	do.	52	20	21.2	Jan. 25, 3 p. m.	866.3	[2] 29.4	Mar. 17, 1865
30.6	Lock No. 5	do.	64	24	34.2	Jan. 25, 8 p. m.	768.7	45.7	Mar. 18, 1936
24.1	Lock No. 4	do.	10	24	31.6	Jan. 25, 9 p. m.	756.1	43.6	Do.
14.7	Lock No. 3	do.	2	25	32.8	Jan. 25, 11 p. m.	742.8	45.2	Do.
	Elkins, W. Va.	Tygart	5	15	10.1	Jan. 21, 8 a. m.	1,910.5		
46	Philippi, W. Va.	do.	18	20	14.7	Jan. 23, 8 a. m.	1,291.5	[2] 27.3	July 25, 1912
69	Weston, W. Va.	West Fork	34	20	15.9	Jan. 23, late afternoon	1,011.5	[2] 21.0	Oct. 13, 1890
68	Confluence, Pa.	Youghiogheny	64	14	9.4	Jan. 11 and 23, 8 a. m.	1,316.8	21.9	Mar. 29, 1924
	Connellsville, Pa.	do.	29	13	11.9	Jan. 10, midnight	872.0	20.5	Do.
19	West Newton, Pa.	do.	47	20	13.4	Jan. 11, 8 a. m.	754.1	30.6	Feb. 27, 1912
124.2	Lock No. 15	Monongahela	33	22	21.8	Jan. 23, 9 a. m.	860.7	29.4	Jan. 2, 1919
101.5	Lock No. 10	do.	54	25	21.6	Jan. 23, 1 p. m.	807.2	37.0	July 10, 1888
84.8	Lock No. 7	do.	49	30	30.9	Jan. 23, noon	783.9	[2] 49.1	Do.
41.5	Lock No. 4	do.	51	30	30.0	Jan. 25, 3 p. m.	746.2	43.53	July 11, 1888
14.6	McKeesport, Pa.	do.	24	20	17.0	Jan. 25, 10 p. m.	735.2	28.8	Mar. 18, 1936
4.0	Beaver Falls, Pa.	Beaver	29	15	13.8	Jan. 25, 2 p. m.	745.0	17.4	Mar. 27, 1913
23	Newcomerstown, Ohio	Tuscarawas	9	16	20.6	Jan. 26, 9 p. m.	800.6	[2] 21.5	Mar. —, 1913
0.2	Coshocton, Ohio	do.	29	11	23.3	Jan. 26	756.8	30.5	Mar. 26, 1913
75.8	Lock No. 10	Muskingum	46	25	37.6	Jan. 25, 11 p. m.	702.9	51.8	Mar. 27, 1913
48.2	Lock No. 7	do.	24	22	[3] 36.0	Jan. 26, 8 a. m.	671.0	49.1	Do.
0.2	Lock No. 1 (lower gage)	do.	23	35	55.0	Jan. 26, midnight	622.1	48.1	Mar. 20, 1936
103.0	Glenville, W. Va.	Little Kanawha	36	23	25.1	Jan. 23, 9 a. m.	722.9	33.6	Nov. 16, 1926
48.0	Creston, W. Va.	do.	36	20	22.8	Jan. 23, 5 p. m.	644.5	32.0	Mar. 14, 1918
31.6	Athens, Ohio	Hocking	21	17	22.4	Jan. 23, 8 a. m.	638.0	[2] 26.7	Mar. 14, 1907
71	Camden on Gauley, W. Va.	Gauley	21	23	10.0	Jan. 21	2,013.3	[2] 27.4	July 4, 1932
42	Summersville, W. Va.	do.	17	18	11.0	Jan. 21, 8 a. m.		28.75	Do.
194	Ivanhoe, Va.	New	20	15	8.9	Jan. 20, 8 a. m.	1,950.8	[2] 35.4	July 16, 1916
145	Radford, Va.	do.	41	14	6.9	Jan. 20, 2 p. m.		[2] 34.0	Sept. 13, 1878
95	Glenlyn, Va.	do.	11	11	10.4	Jan. 21, 8 a. m.	1,502.4	[2] 24.0	July —, 1916
63	Hinton, W. Va.	do.	50	14	11.0	do.	1,362.6	20.2	Sept. 13, 1878
53.2	Clay, W. Va.	Elk	22	18	12.8	Jan. 25, 6 p. m.	689.4	32.4	Mar. 14, 1918
95.0	Kanawha Falls, W. Va.	Kanawha	23	25	19.0	Jan. 21, 7 a. m.	641.9	[2] 37.8	Sept. 14, 1878
82.8	London Dam	do.	3	43	26.7	Jan. 21, 6 a. m.			
54.0	Lock No. 6	do.	50	42	34.6	Jan. 22, 7 a. m.	582.5	48.9	Mar. 5, 1899
81.4	Logan, W. Va.	Guyandot	15	20	12.5	Feb. 10, 1 a. m.	651.6	27.0	Jan. 28, 1918
28.8	Wayne, W. Va.	Twelvepole Creek	12	25	15.3	Jan. 23, 8 a. m.	620.0	28.3	June 30, 1928
57.3	Williamson, W. Va.	Tug Fork	30	38	21.0	Feb. 10		38.1	Jan. 29, 1918
88.5	Pikeville, Ky.	Levisa Fork	29	35	30.3	Feb. 9	664.3	49.0	Jan. 28, 1918
38.5	Paintsville, Ky.	do.	9	40	30.3	Jan. 19, 5 p. m.	597.0	34.98	Mar. 13, 1935
26.6	Lock No. 3	Big Sandy	48	45	45.4	Jan. 27, 8 a. m.	562.2	[2] 48.4	Apr. 3, 1908
196.2	La Rue, Ohio	Scioto	21	11	13.9	Jan. 15, 8 a. m.	924.1	[2] 17.8	Mar. 26, 1913
172.2	Prospect, Ohio	do.	30	10	13.3	Jan. 23, 8 a. m.	905.0	[2] 21.1	Do.
131.9	Columbus, Ohio	do.	39	22	12.3	Jan. 15, 10:30 a. m.	712.3	22.9	Mar. 25, 1913
70.4	Chillicothe, Ohio	do.	29	16	27.9	Jan. 23, 6 a. m.	621.9	39.8	Mar. 26, 1913
28.1	Kings Mills, Ohio	Little Miami	12	17	24.8	Jan. 22, 6 a. m.	611.9	33.7	Do.
46	Cynthiana, Ky.	South Fork	20	20	20.0	Jan. 22, 8 a. m.		22.6	Dec. 24, 1921
172	Farmers, Ky.	Licking	20	25	26.2	Jan. 25, 10 a. m.	672.6	31.1	Feb. 9, 1918
51.2	Falmouth, Ky.	do.	50	28	41.4	Jan. 23, 2 a. m.	552.8	[2] 41.1	Aug. 2, 1854
29.2	Pleasant Hill, Ohio	Stillwater	21	13	17.5	Jan. 15, 11 p. m.	864.1	[2] 17.5	Mar. 25, 1913
23.6	Springfield, Ohio	Mad	23	11	14.1	Jan. 25, 8 a. m.	896.0	[2] 16.9	Do.
27	Brookville, Ind.	Whitewater	19	20	22.8	Jan. 15, 5 a. m.	618.5	[2] 43.5	Mar. 26, 1913
134.8	Sidney, Ohio	Miami	23	12	11.8	Jan. 15, 8 a. m.	936.5	[2] 19.6	Mar. 25, 1913
122.1	Piqua, Ohio	do.	26	17	12.9	do.	856.9	20.1	Do.
104.5	Tippecanoe City, Ohio	do.	14	27	13.5	do.	800.3	13.8	Mar. 21, 1927
84.5	Dayton, Ohio	do.	44	21	14.6	Jan. 22, 1 a. m.	735.6	31.7	Mar. 25, 1913
68.6	Miamisburg, Ohio	do.	14	22	20.6	Jan. 22, 3 a. m.	699.0	[2] 33.6	Mar. 26, 1913
61.3	Franklin, Ohio	do.	14	16	16.7	Jan. 22, 8 a. m.	675.1	[2] 23.0	Do.
53.6	Middletown, Ohio	do.	14	15	17.5	do.	642.2	[2] 29.0	Do.
35.3	Hamilton, Ohio	do.	27	17	17.3	do.	577.3	43.1	Do.
96.0	Hazard, Ky.	North Fork	12	20	13.0	Jan. 25, 8 a. m.		[2] 38.5	———, 1912
	Jackson, Ky.	do.	31	28	26.0	Jan. 25, 10 p. m.	724.7	41.9	May 30, 1927
249.3	Lock No. 14	Kentucky	20	30	21.2	Jan. 26, 7 a. m.	648.4	34.4	Mar. 24, 1929
176.3	Lock No. 10	do.	31	30	30.6	Jan. 23, 7:30 a. m.	587.4	35.1	Mar. 29, 1913
117.0	Lock No. 7	do.	36	30	42.2	Jan. 23, 11 a. m.	545.9	34.8	Dec. 26, 1926
65.0	Lock No. 4	do.	51	31	47.6	Jan. 25, 10 a. m.	509.8	[2] 42.1	Feb. —, 1883
29.5	Bowling Green, Ky.	Barren	13	20	40.7	Jan. 23	448.7	36.5	Jan. 3, 1919
180.6	Lock No. 6	Green	20	28	54.7	Jan. 24	458.0	52.8	Jan. 10, 1913
149.5	Lock No. 4	do.	38	33	59.0	Jan. 24, 11 p. m.	432.8	54.4	Jan. 11, 1913
62.8	Lock No. 2	do.	38	34	54.4	Jan. 30, 7 a. m.	398.0	47.9	Mar. 31, 1904
242.6	Anderson, Ind.	West Fork	26	8	18.6	Jan. 15, 1 p. m.		22.9	Mar. 25, 1913
215.1	Noblesville, Ind.	do.	23	14	18.8	Jan. 16, 8 a. m.		[2] 23.8	Do.
185.3	Indianapolis Ind.	do.	26	12	16.8	Jan. 16, 4 p. m.		29.5	Mar. 26, 1913
78.2	Elliston, Ind.	do.	29	18	30.2	Jan. 17, 8 p. m.	503.1	31.3	Mar. 27, 1913
32.6	Edwardsport, Ind.	do.	14	12	20.8	Jan. 18, midnight		20.3	Jan. 14, 1930
167.7	Seymour, Ind.	East Fork	14	14	19.5	Jan. 16, 3 a. m.	570.2	[2] 18.1	Mar. 26, 1913
79.2	Williams, Ind.	do.	16	10	25.0	Jan. 25, 8 a. m.	497.6	20.6	Jan. 14, 1930
56.0	Shoals, Ind.	do.	29	25	37.2	Jan. 25, 11 a. m.	479.4	42.2	Mar. 28, 1913
47.8	Petersburg, Ind.	White	2	16	28.1	Jan. 21, 4 p. m.	428.1		
18.9	Hazleton, Ind.	do.	13	16	31.6	Jan. 24, 3 a. m.	414.9	30.4	Jan. 17, 1930
421.8	Bluffton, Ind.	Wabash	26	10	14.9	Jan. 16, 10 p. m.		20.0	Mar. 26, 1913
343.2	Logansport, Ind.	do.	19	17	15.1	Jan. 16, 8 a. m.		25.3	Do.
301.4	La Fayette, Ind.	do.	23	11	21.2	Jan. 17, 8 a. m.	525.3	[2] 32.9	Do.
260.5	Covington, Ind.	do.	10	16	25.3	Jan. 18, 8 a. m.	499.3	[2] 35.1	Mar. —, 1913
204.4	Terre Haute, Ind.	do.	38	14	21.3	Jan. 16, 4 p. m.	467.1	31.3	Mar. 27, 1913
117.2	Vincennes, Ind.	do.	20	14	22.8	Jan. 22, 4 p. m.	419.2	25.2	Jan. 17, 1930
83.9	Mount Carmel, Ill.	do.	53	19	27.0	Jan. 23, 8 a. m.	398.5	31.0	Mar. 30, 1913
44.0	New Harmony, Ind.	do.	3	15	24.4	Jan. 30, 4 p. m.	377.6		
8.2	New River, Tenn.	New	29	20	26.6	Jan. 2, 7 p. m.	1,119.3	41.2	Mar. 23, 1929
90.3	Rock Island, Tenn.	Caney Fork	26	30	22.0	Jan. 3, 8 a. m.	669.4	40.6	Do.
592.7	Williamsburg, Ky.	Cumberland	29	19	22.2	do.	914.6	[2] 33.0	Mar. —, 1886
518.4	Burnside, Ky.	do.	52	50	54.3	do.	639.9	69.4	Mar. 24, 1929
383.1	Celina, Tenn.	do.	33	28	53.6	Jan. 24, 8 a. m.	543.1	57.11	Dec. 29, 1926

[1] Seventy-fifth meridian time used throughout.
[2] Obtained from high-water mark and considered to be reliable.
[3] Estimated.

TABLE 13.—*Flood crests in Ohio and lower Mississippi Basins*—Continued

Distance above mouth	Station	River	Length of record	Flood stage	1937 Highest	1937 Date	Mean sea level elevation of 1937 crest	Prior to 1937 Highest	Prior to 1937 Date
Miles			*Years*	*Feet*	*Feet*		*Feet*	*Feet*	
308.4	Carthage, Tenn.	Cumberland	52	40	54.6	Jan. 26, 6 p. m.	492.5	58.7	Dec. 30, 1926
192.6	Nashville, Tenn.	do.	63	40	53.8	Jan. 26, 8 a. m.	422.0	56.2	Jan. 1, 1927
127.0	Clarksville, Tenn.	do.	36	46	65.6	Jan. 25, 2 p. m.	396.6	[2] 60.6	Jan. —, 1882
43.6	Lock F	do.	19	50	76.9	Jan. 26, 8 a. m.	366.5	68.5	Jan. 5, 1927
38.3	Mendota, Va.	North Fork	31	8	8.7	Feb. 9, midnight	1,339.9	17.5	June 14, 1907
24.4	Elizabethton, Tenn.	Watauga	27	14	8.9	Jan. 3, 8 a. m.	1,494.9	[2] 22.0	Feb. —, 1902
34.2	Bluff City, Tenn.	South Fork	37	12	7.6	Feb. 10, 8 a. m.	1,375.7	15.0	May 22, 1901
103.8	Rogersville, Tenn.	Holston	35	13	10.4	Feb. 10, 2:30 p. m.	1,067.4		Jan. 29, 1918
77	Embreeville, Tenn.	Nolichucky	17	8	6.2	Jan. 3, 8 a. m.	1,525.6		Aug. 16, 1928
147.3	Asheville, N. C.	French Broad	34	6	8.3	do.	1,968.2	25.6	July 16, 1916
	Hot Springs, N. C.	do.	3	14	12.5	do.	1,315.1	[2] 28.6	Do.
46.5	Dandridge, Tenn.	do.	32	12	15.4	Jan. 3, 9 p. m.	918.2	[2] 28.0	May 21, 1901
18.8	McGhee, Tenn.	Little Tennessee	33	18	20.4	Jan. 3, 3 p. m.	780.5	[2] 39.0	Mar. —, 1867
59.5	Clinton, Tenn.	Clinch	53	25	25.9	Feb. 18, 8 a. m.	802.5	45.0	Mar. 31, 1886
18.8	Charleston, Tenn.	Hiwassee	54	22	21.8	Jan. 4, 8 a. m.	687.3	34.0	Do.
648.1	Knoxville, Tenn.	Tennessee	54	20	19.0	Jan. 4, 7 a. m.	816.6	[2] 44.4	Mar. 10, 1867
591.3	Loudon, Tenn.	do.	52	22	21.2	Jan. 4, 8 a. m.	747.3	32.9	Mar. 5, 1917
568.0	Kingston, Tenn.	do.	57	26	20.3	do.	720.3		
523.2	Breedenton, Tenn.	do.	3	28	23.2	Jan. 4, 11 a. m.	688.4	[2] 43.8	Mar. 11, 1867
464.1	Chattanooga, Tenn.	do.	63	30	33.0	Jan. 5, 1 a. m.	654.1	[2] 57.7	Do.
	Hales Bar Lock, Tenn.:								
431.1	Upper gage	do.	31	50	49.4	Jan. 5, 8 a. m.	638.0	54.0	Mar. 8, 1917
431.1	Lower gage	do.	31	30	28.9	do.	617.5	[2] 47.3	Mar. 11, 1867
414.4	Bridgeport, Ala.	do.	44	18	23.7	do.	608.9	[2] 41.2	Mar. —, 1867
	Widows Bar Lock, Ala.:								
408.0	Upper gage	do.	18	17	24.8	do.	605.6		
408.0	Lower gage	do.	18	26	32.8	do.	605.4		
358.1	Guntersville, Ala.	do.	35	25	32.0	Jan. 6, 5 p. m.	578.8	[2] 46.5	Mar. —, 1875
304.4	Decatur, Ala.	do.	62	25	23.9	Jan. 25, 8 a. m.	558.0	[2] 29.5	Mar. 15, 1867
256.5	Florence, Ala.	do.	66	18	20.1	Jan. 4, 5:30 p. m.	421.2	32.5	Mar. 19, 1897
226.5	Riverton, Ala.	do.	41	33	40.9	Jan. 27, 8 a. m.	396.6	58.4	Mar. 20, 1897
189.5	Savannah, Tenn.	do.	26	39	42.2	do.	383.6	[2] 59.6	Mar. 21, 1897
96.5	Johnsonville, Tenn.	do.	60	31	41.0	Jan. 25, 8 a. m.	361.5	48.0	Mar. 24, 1897
981.0	Pittsburgh, Pa.	Ohio	65	25	34.5	Jan. 26, 3 a. m.	728.5	46.0	Mar. 18, 1936
971.8	Old Dam No. 2	do.	30	26	31.1	Jan. 26, 5 a. m.	714.5	43.6	Do.
893.6	Dam No. 12	do.	26	36	48.7	Jan. 26, 6 p. m.	659.5	55.2	Mar. 19, 1936
884.9	Dam No. 13	do.	36	45	52.0	do.	654.8	57.9	Do.
796.4	Parkersburg, W. Va.	do.	49	36	55.4	Jan. 26, 4 p. m.	617.3	58.9	Mar. 29, 1913
788.8	Dam No. 19	do.	20	40	58.0	Jan. 26, 2 p. m.	613.3	[2] 61.5	Do.
778.5	Dam No. 20	do.	20	45	58.6	Jan. 27, 1 a. m.	607.7	[2] 61.8	Do.
760.1	Dam No. 22	do.	22	44	62.6	Jan. 27, 2 a. m.	598.6	[2] 64.9	Mar. 30, 1913
720.3	Dam No. 25	do.	9	43	66.9	Jan. 27	579.0	[2] 66.5	Do.
715.8	Point Pleasant, W. Va.	do.	48	40	62.7	Jan. 27, 8 a. m.	576.8	62.8	Do.
702.5	Dam No. 26	do.	23	50	70.3	Jan. 27, 1 p. m.	572.9	[2] 68.7	Do.
669.4	Dam No. 28	do.	23	50	69.4	Jan. 27, 6 a. m.	559.6	65.3	Do.
661.1	Dam No. 29	do.	20	51	73.6	Jan. 27, noon	556.7	70.0	Mar. 31, 1913
641.6	Dam No. 30	do.	17	52	74.7	Jan. 27, 2 p. m.	549.8	[2] 69.8	Do.
625.0	Portsmouth, Ohio	do.	50	50	74.2	Jan. 27, 3 p. m.	545.1	67.9	Do.
598.4	Dam No. 32	do.	18	53	75.5	Jan. 27, 11 a. m.	535.6	[2] 69.0	Do.
575.9	Dam No. 33	do.	13	50	75.3	Jan. 27, 7 a. m.	527.9	[2] 68.4	Do.
530.0	Dam No. 35	do.	16	48	75.1	Jan. 26, 4 a. m.	515.1	[2] 66.2	Feb. 14, 1884
520.1	Dam No. 36	do.	11	52	79.8	Jan. 26, 2 a. m.	513.4	[2] 70.2	Do.
509.8	Cincinnati, Ohio	do.	79	52	80.0	Jan. 26, 4 a. m.	508.8	71.1	Do.
497.8	Dam No. 37	do.	23	50	78.8	Jan. 25, 10 p. m.	504.1	[2] 69.0	Do.
477.7	Dam No. 38	do.	12	51	78.6	Jan. 26, 2 p. m.	496.5	[2] 69.2	Do.
449.3	Dam No. 39	do.	21	48	73.5	Jan. 26, 7 a. m.	484.1	64.1	Apr. 1, 1913
	Louisville, Ky.:								
374.0	Upper gage	do.	65	28	57.15	Jan. 27, 10 a. m.	460.15	46.7	Feb. 16, 1884
374.0	Lower gage	do.	65	55	85.4	Jan. 27	459.5	74.3	Do.
347.8	Dam No. 43	do.	14	57	87.0	Jan. 27, 7 a. m.	453.1	[2] 74.4	Feb. —, 1884
317.8	Dam No. 44	do.	11	53	84.2	Jan. 27	441.3	[2] 73.5	Do.
278.0	Dam No. 45	do.	9	47	68.9	Jan. 28, 2 a. m.	418.5	[2] 60.9	Do.
223.7	Dam No. 46	do.	14	41	54.8	Jan. 29, midnight	393.9	[2] 49.3	Apr. —, 1913
203.3	Dam No. 47	do.	14	38	56.6	Jan. 31, 6 p. m.	387.2	[2] 50.7	Do.
188.7	Evansville, Ind.	do.	45	35	53.75	Feb. 1, 1 a. m.	383.0	48.4	Apr. 5, 1913
171.4	Dam No. 48	do.	15	38	58.6	Feb. 1, 7 a. m.	381.2	[2] 52.2	Apr. —, 1913
136.0	Dam No. 49	do.	13	37	64.4	Feb. 1, 8 p. m.	376.5	[2] 57.8	Do.
104.2	Dam No. 50	do.	13	34	68.3	Feb. 2, 9 p. m.	369.4	[2] 61.4	Apr. 5, 1913
77.9	Dam No. 51	do.	12	40	62.6	Feb. 2, 7 a. m.	357.2	[2] 56.8	Apr. —, 1913
46.6	Paducah, Ky.	do.	63	39	60.6	Feb. 2	346.9	54.3	Apr. 7, 1913
42.1	Dam No. 52	do.	13	37	62.3	Feb. 2, 3 a. m.	345.6	[2] 55.9	Feb. 23, 1884
18.4	Dam No. 53	do.	13	42	64.0	Feb. 2, 7 a. m.	337.1	[2] 57.3	Apr. 8, 1913
1.7	Cairo, Ill.	do.	76	40	59.5	Feb. 3, 8 a. m.	330.1	56.4	Apr. 20, 1927
1,247.3	St. Louis, Mo.	Mississippi	79	30	12.8	Jan. 17, 8 a. m.	392.6	[2] 41.39	June 27, 1844
					12.2	Feb. 5, 8 a. m.	392.0		
					18.8	Feb. 25, 8 a. m.	398.6		
1,177.3	Chester, Ill.	do.	46	27	14.9	Jan. 18, 8 a. m.	355.7	[2] 39.87	June —, 1844
					13.6	Feb. 6, 8 a. m.	354.4		
					19.3	Feb. 26, 8 a. m.	360.1		
1,119.8	Cape Girardeau, Mo.	do.	45	32	26.7	Jan. 26, 8 a. m.	331.2	[2] 42.5	July 4, 1844
					27.5	Feb. 6, 8 a. m.	332.0		
	Manila, Ark.	Big Lake Outlet	9	10	21.4	Jan. 27, 8 a. m.		20.3	Apr. —, 1927
315	Fisk, Mo.	St. Francis	14	20	23.4	Jan. 2, 1 p. m.	331.3	27.0	Mar. 12, 1935
					26.2	Jan. 15, late evening	334.1		
					23.3	Feb. 3, early morning	331.2		
256	St. Francis, Ark.	do.	23	18	26.7	Jan. 19, 11 a. m.	297.7	28.2	Mar. 15, 1935
					21.1	Feb. 5, 8 a. m.	292.1		
156	St. Francis Lake Lock, Ark.	do.	10	30	31.1	Jan. 27, 8 a. m.			
148	Marked Tree, Ark.	do.	30	17	18.8	Feb. 5, 8 a. m.	215.2	24.2	Apr. 18, 1912
100	Parkin, Ark.	do.	44	28	34.3	Feb. 4, 9 a. m.	209.7	41.6	Apr. 4, 1897
	Madison, Ark.	do.	37	32	40.7	Feb. 13, 8 a. m.	206.6	41.8	Apr. 21, 1912
250	Leeper, Mo.	Black	16	11	14.1	Jan. 15, 8 a. m.	438.8	[2] 21.3	Aug. 20, 1915
211	Poplar Bluff, Mo.	do.	14	14	17.6	Jan. 16, 8 a. m.	337.5	19.1	Mar. 12, 1935
69	Black Rock, Ark.	do.	33	14	26.2	Jan. 16, 1 a. m.	255.7	31.9	Aug. 21, 1915
300	Calico Rock, Ark.	White	33	18	27.4	Jan. 15, 8:30 a. m.	345.2	50.9	Jan. 31, 1916
					15.0	Feb. 1, 8 a. m.	332.8		
301	Batesville, Ark.	do.	33	23	31.5	Jan. 15, 11 p. m.		43.4	Feb. 1, 1916
					22.7	Feb. 2, late evening			

[2] Obtained from high-water mark and considered to be reliable.

TABLE 13.—*Flood crests in Ohio and lower Mississippi Basins*—Continued

Distance above mouth	Station	River	Length of record	Flood stage	1937 Highest	1937 Date	Mean sea level elevation of 1937 crest	Prior to 1937 Highest	Prior to 1937 Date
Miles			*Years*	*Feet*	*Feet*		*Feet*	*Feet*	
258	Newport, Ark	White	47	26	30.7	Jan. 18, 4 p. m.	224.8	35.6	Apr. 16, 1927
					27.8	Feb. 3, 8 a. m.	221.9		
171	Georgetown, Ark	do	25	21	30.3	Jan. 24, 8 a. m.	200.5	31.3	Mar. 18, 1935
100	Clarendon, Ark	do	33	26	35.7	Jan. 28, 8 a. m.	175.7	43.3	Apr. 23, 1927
433	Webbers Falls, Okla	Arkansas	29	23	19.9	Jan. 16, 8 a. m.	464.4	[2] 38.2	June —, 1833
					20.3	Feb. 1, 8 a. m.	464.8		
373	Fort Smith, Ark	do	58	22	21.8	Jan. 17, noon	402.4	[2] 38.0	Do.
					20.8	Feb. 2, 8 a. m.	401.4		
366	Van Buren, Ark	do	10	22	22.0	Jan. 17, 8 a. m.	394.4	[2] 35.0	Apr. —, 1927
					21.1	Feb. 2, 8 a. m.	393.5		
322	Ozark, Ark	do	10	22	17.0	Jan. 17, 8 a. m.	354.0	[2] 36.2	Apr. 18, 1927
					16.0	Feb. 2, 8 a. m.	353.0		
265	Dardanelle, Ark	do	47	22	19.4	Jan. 18, 8 a. m.	309.6	33.0	Apr. 19, 1927
					18.8	Feb. 3, 8 a. m.	309.0		
233	Morrilton, Ark	do	10	20	17.8	Jan. 18, 8 a. m.		32.0	Do.
					16.6	Feb. 3, 8 a. m.			
178	Little Rock, Ark	do	58	23	18.8	Jan. 18, 2 p. m.	242.4	[2] 34.6	June —, 1833
					17.6	Feb. 3, late evening	241.2		
117	Pine Bluff, Ark	do	31	25	22.1	Jan. 19, 8 a. m.	203.1	33.0	June 24, 1935
					20.7	Feb. 4, 8 a. m.	201.7		
71.4	Swan Lake, Miss	Tallahatchie	23	26	33.9	Feb. 2, 8 a. m.	147.7	37.0	Jan. 15, 1932
175	Greenwood, Miss	Yazoo	33	35	36.4	Feb. 9, 8 a. m.	128.4	[2] 41.2	———, 1882
77	Yazoo City, Miss	do	50	29	37.1	Feb. 24, 8 a. m.	104.7	43.4	May 5, 1927
361	Arkadelphia, Ark	Ouachita	24	17	26.0	Jan. 23, 8 a. m.	185.9	29.2	Apr. 21, 1927
					11.2	Feb. 20, 8 a. m.	171.1		
295	Camden, Ark	do	51	26	41.5	Jan. 25, 8 a. m.	113.2	[4] 41.0	May 21, 1930
					19.9	Feb. 23, 8 a. m.	91.6		
126	Monroe, La	do	53	40	44.7	Feb. 9, 8 a. m.	76.2	49.7	Feb. 2, 1932
56	Jonesville, La	Black	6	50	55.8	Mar. 5, 9 a. m.	57.3	55.6	Mar. 5, 1932
55	Whitecliffs, Ark	Little	33	25	26.4	Jan. 25, 8 a. m.		32.0	Aug. 21, 1915
	Ringo Crossing, Tex	Sulphur	27	20	23.0	Jan. 15, 8 a. m.	334.5	31.4	June 17, 1935
					23.5	Jan. 25, 8 a. m.	335.0		
	Naples, Tex	do	27	22	22.8	Jan. 4, 8 a. m.	243.5	31.7	May 19, 1930
					25.5	Jan. 21, 8 a. m.	246.2		
					25.4	Jan. 30–Feb. 1, 8 a. m.	246.1		
	Jefferson, Tex	Cypress	24	18	19.4	Jan. 28, 8 a. m.	183.9	28.6	May 20, 1930
507	Index (Miller County), Ark	Red	20	25	18.2	Jan. 17, 8 a. m.	265.0	31.1	May 25, 1935
482	Fulton, Ark	do	52	25	22.4	do	246.9	35.0	Apr. 24, 1927
	Springbank, Ark	do	29	37	23.7	Jan. 29, 8 a. m.	197.6	41.5	May 6, 1915
306	Shreveport, La	do	64	39	23.2	do	154.7	45.7	May 28, 1892
206	Grand Ecore, La	do	23	33	29.7	Jan. 31, 9 a. m.	104.7	[2] 40.5	———, 1908
122	Alexandria, La	do	65	32	33.0	Feb. 2, 8 a. m.	77.4	43.6	Feb. 3, 1932
999	New Madrid, Mo	Mississippi	58	34	47.9	do	303.9	44.6	Apr. 9, 1913
842	Memphis, Tenn	do	66	34	48.7	Feb. 10, 11 a. m.	232.6	46.6	Do.
763	Helena, Ark	do	66	44	60.2	Feb. 12, 11 p. m.	201.9	56.8	Apr. 26, 1927
632	Arkansas City, Ark	do	52	42	53.8	Feb. 12, 8 a. m.	150.6	60.4	Apr. 21, 1927
590	Greenville, Miss	do	45	36	52.2	Feb. 15, 8 a. m.	140.7	54.7	Do.
467	Vicksburg, Miss	do	66	43	53.2	Feb. 21, 8 a. m.	99.4	58.6	May 4, 1927
364	Natchez, Miss	do	66	48	58.0	Feb. 21, 3 p. m.	75.1	56.6	Do.
298	Angola, La	do	66	45	55.5	Feb. 27, 8 a. m.	59.1	57.5	May 15, 1927
227	Baton Rouge, La	do	65	35	45.0	Feb. 28, 9 a. m., 2 p. m.	44.6	47.8	Do.
174	Donaldsonville, La	do	47	28	34.5	Feb. 27, 5 p. m., 9 p. m.	33.3	37.2	Do.
138	Reserve, La	do	8	22	25.6	Feb. 26, 8 a. m.	25.6	26.0	June 11, 1929
103	New Orleans, La	do	78	17	19.3	Feb. 28, midnight	19.2	21.3	Apr. 25, 1922
[5] 5	Simmesport, La	Atchafalaya	36	41	49.3	Mar. 1, 8 a. m.	55.1	53.4	May 16, 1927
[5] 31	Melville, La	do	52	37	44.8	Mar. 2, 8 a. m.	45.0	46.8	May 14, 1927
[5] 62	Atchafalaya, La	do	6	25	25.9	Mar. 7, 9 a. m.	25.9	24.9	Mar. 3, 1932
[5] 124	Morgan City, La	do	32	6	6.6	Mar. 12, 14, 8 a. m.	3.7	9.7	June 10, 1927

[2] Obtained from high-water mark and considered to be reliable.
[4] 46.0 May 12, 1882, from high-water mark at old gage site, 1½ miles downstream.
[5] Distance from head.

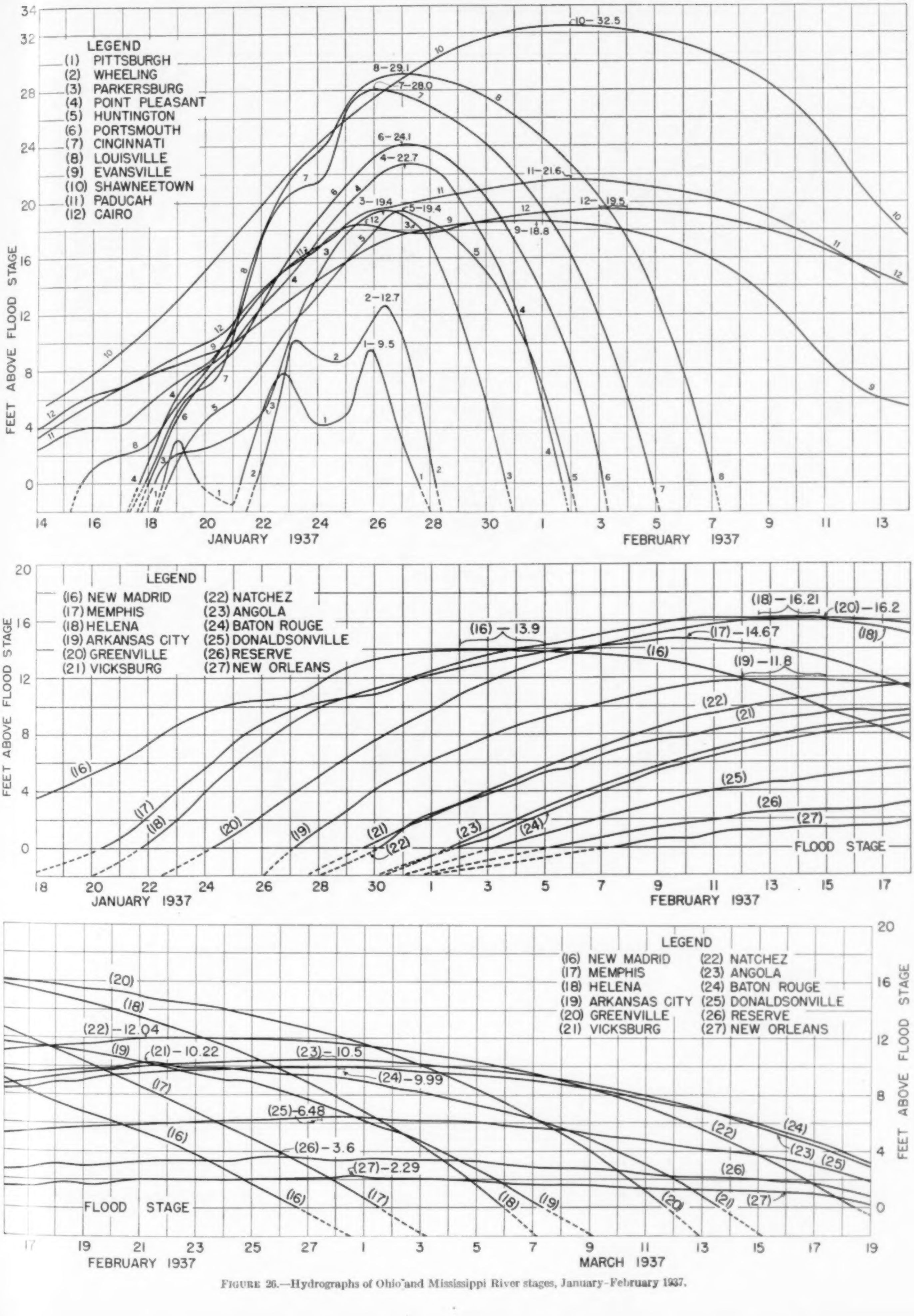

FIGURE 26.—Hydrographs of Ohio and Mississippi River stages, January–February 1937.

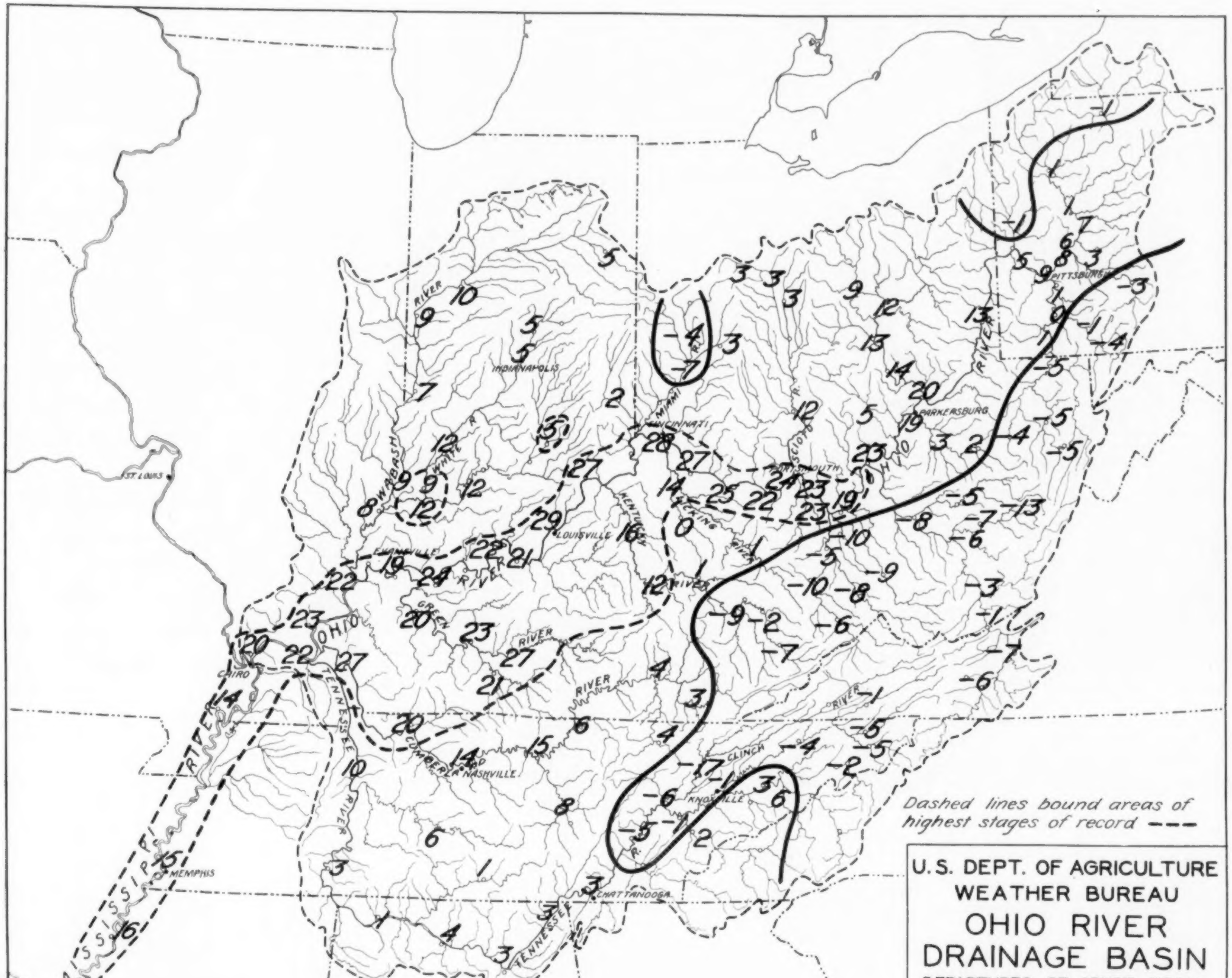

FIGURE 27.—Departures of crest stages from flood stage, January and February 1937.

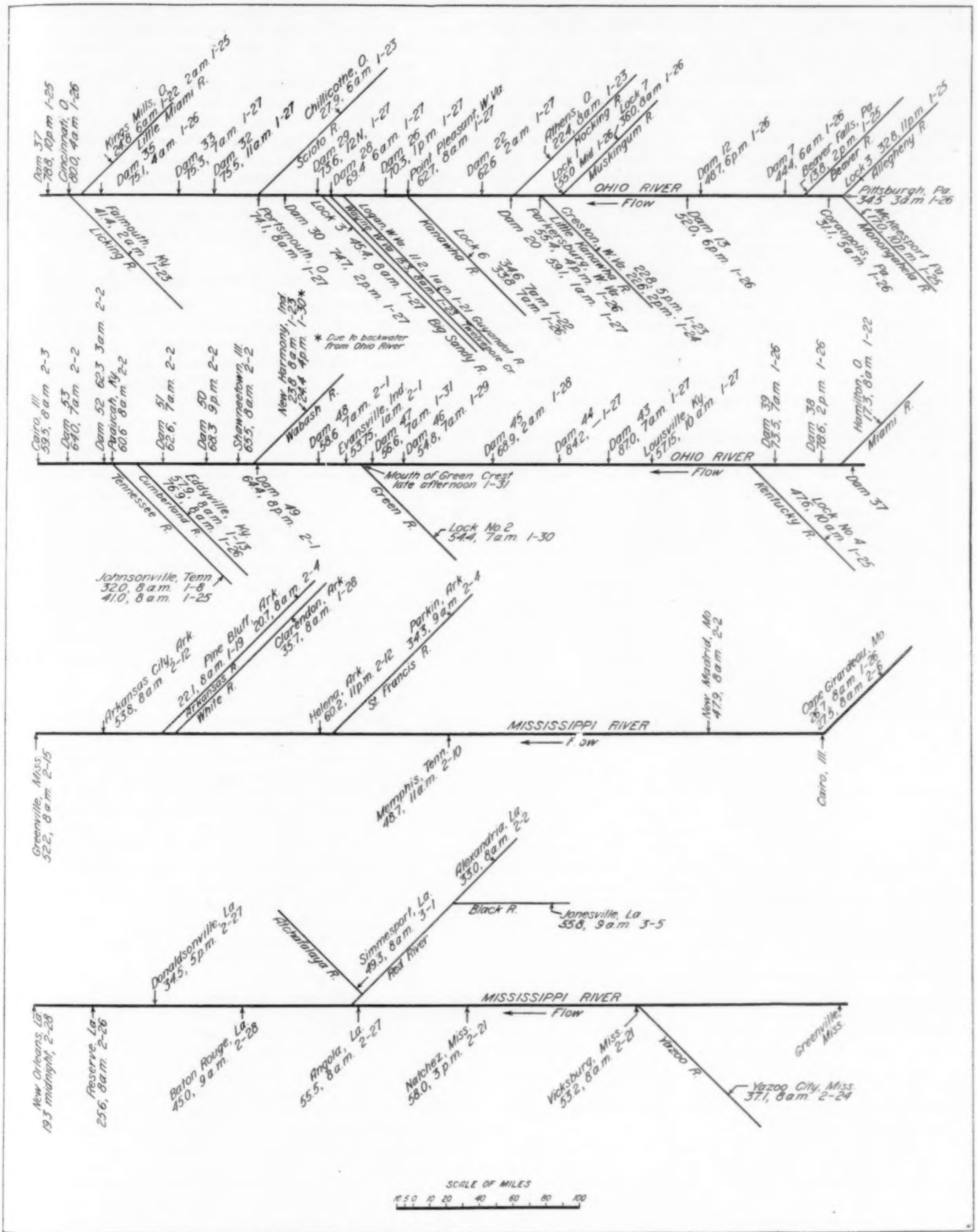

FIGURE 28.—Time of occurrence of flood crests along Ohio and Mississippi Rivers, January-February 1937.

NOTE.—Revised crests, Ohio River; Dam 20, 58.6, Jan. 27, 1 a. m.; Portsmouth, Ohio, 74.2, Jan. 27, 3 p. m.; Dam 46, 54.8, Jan. 29, midnight; Dam 47, 56.6, Jan. 31, 6 p. m.; and Paducah, Ky., 60.6, Feb. 2, time unknown. (75th meridian time used throughout.)

The greatest overflow was in the lower third of the Ohio River, and most of the cities in this region were partially or completely submerged. Two-thirds of Louisville was under water (fig. 29), as was one-third of Evansville. A number of smaller cities and towns, such as Jeffersonville and Leavenworth, Ind., Brookport, Shawneetown, and Mound City, Ill., were almost completely inundated. Mound City and Shawneetown were protected by levees, but the water overtopped them, at the latter by more than 5 feet. In the region above Louisville great damage from floodwaters occurred in Cincinnati and Portsmouth, Ohio and, Point Pleasant, Parkersburg, and Wheeling, W. Va. Along the Ohio all cities were wholly or partially submerged, with the exception of Cairo, whose protection works were effective.

The flood plain of the Ohio River begins to widen at Hawesville, Ky., and attains a width of about 25 miles near Evansville. The valley floor continues at this width to Shawneetown, Ill., where it narrows, forming a bottleneck slightly below. This valley restriction extends to a point below Paducah and influences the river stages in the reach above so that several towns and cities, some of which are 25 to 30 miles inland, were affected.

In the area from the Wabash to the Saline Valley in Illinois, 90 percent of Gallatin County and 30 percent of Saline County were under water. At Harrisburg, Ill., 22 miles from the Ohio River, the floodwaters inundated all but small portions of the city and reached an elevation 0.8 foot higher than the stage at Shawneetown.

Areas along the south bank of the Ohio River were also extensively flooded. Paducah, Ky., a city of about 35,000 population, was almost completely submerged.

Disaster was apparently averted at Cairo by opening the "fuse plug" levee at the upper end of the Birds Point-New Madrid floodway on January 25 and 26, diverting a maximum flow of about 500,000 second-feet. As the water spread over the 130,000-acre floodway the stage at Cairo dropped from 58.5 feet on the afternoon of the 25th to 57.8 feet on the morning of the 28th. Thereafter, the stage rose at a slower rate until the crest, 59.5 feet, was reached on February 3.

Water from the Ohio River backed up Big Bay Creek, whose outlet is 8 miles below Golconda, Ill., and overtopped the ridge separating it from the Cache Valley. The overflow thereafter followed the Cache River across extreme southern Illinois, and a portion of the water entered the Mississippi River just above Cairo. A description of the route taken by this overflow appears in the Monthly Weather Review for February 1937, page 80. This diversion, together with that through the Birds Point-New Madrid floodway, materially decreased the rate of rise from Cairo to Paducah.

The maximum discharge through Big Bay Creek, determined by the United States Geological Survey as about 70,000 second-feet at New Columbia, Ill., on February 2 and 3, reduced the flow at Paducah by that amount. The maximum discharge in the Ohio at Metropolis, Ill., about 1,780,000 second-feet on February 2, added to that measured at New Columbia, gives a total peak discharge for the Ohio River of 1,850,000 second-feet. The previous highest discharge of record, estimated at 1,600,000 second-feet, occurred in March 1913.

From data furnished by the Illinois Division of Highways and the United States Engineers, a fall of about 14 feet was observed in the overflow between Bay City, Ill., on the Ohio River, and Ullin, Ill., on the Cache River. There was a fall of 10.7 feet in Cache River from Ullin to the vicinity of Cache Village, where the diverted flood waters entered the Mississippi River. Excessive damage was caused throughout the reach by the current, estimated at 12 to 17 miles per hour at various points.

Table 14 shows the total number of days above flood stage at selected points throughout the Ohio and lower Mississippi Basins. Of the principal tributaries of the Ohio, the Wabash and White Rivers were above flood stage the greatest length of time. The White River at Hazleton, Ind., was above flood stage for a period of 39 days. The lower portions of most of the tributaries were, of course, influenced by the backwater from the Ohio River.

The period above flood stage in the Ohio increased from 7 days in the upper portion to 50 days at Cairo, Ill. In the lower Mississippi the length of the period conformed with that at Cairo. At Simmesport, La., the Atchafalaya River was above flood stage from February 6 to March 22, or a total of 45 days.

FLOODS IN THE LOWER MISSISSIPPI RIVER

A brief history.—The lower Mississippi Basin is the smallest of the six subdivisions of the Mississippi system. (See fig. 1.) Included in the basin are the small tributaries discharging directly into the Mississippi south of the Ohio. The only ones materially influencing main river stages are the St. Francis and Yazoo Rivers. Although their basins are relatively small, the annual precipitation over the region is heavy (see table 2) and the discharge is quite large.

Floods occur more frequently in the lower than in the upper Mississippi. The most notable floods of record in the lower Mississippi occurred in 1815, 1828, 1844, 1849, 1850, 1851, 1858, 1859, 1862, 1865, 1867, 1874, 1882, 1884, 1890, 1893, 1897, 1903, 1912, 1913, 1916, 1922, 1927, 1929, and 1937, a total of 25 years, or an average of one in about 5 years. In the upper Mississippi, including the Missouri, the years of unusual high water, indicated by the St. Louis record, are 1785, 1811, 1823, 1826, 1844, 1851, 1855, 1858, 1862, 1876, 1881, 1883, 1892, 1903, 1904, 1908, 1909, 1917, 1922, 1927, 1929, and 1935, a total of 22 years, or an average of one flood each 7 years.

The possibility of a synchronized flood in the Mississippi Basin.—The upper Mississippi and the Missouri by themselves are incapable of producing a great flood in the lower river. Yet, as they usually rise later than the Ohio, they serve to prolong high water and, at times, to increase the stages. The lower western tributaries do not, as a rule, play an important part in the causation of floods in the lower Mississippi. However, the floods of 1922 and 1927 demonstrate that floods in the upper Mississippi and the Ohio can combine with floods in the Arkansas and Red Rivers to produce a great flood in the lower Mississippi. In the 1922 flood the discharge from the Ohio was quite large and that from the upper Mississippi was not excessive, while in the 1927 flood the upper Mississippi discharge was unusually high and the Ohio River discharge was moderate. On the other hand, normal rains of late winter and early spring over the lower Mississippi are usually sufficient to bring the river almost to flood stage from Cairo to the mouth. Then, with heavier rains than usual over the Ohio Basin, an enormous volume of water is discharged from that basin into the lower Mississippi, which being already at bankful stage, results in a disastrous flood.

That an excessive discharge from the Ohio alone can produce unusual floods in the lower Mississippi was demonstrated in the floods of 1913 and 1937, which were two of the most severe floods experienced on the lower Mississippi and were caused almost entirely by unprecedented floods in the Ohio River. Table 15 gives comparative stages in the Mississippi and principal tributaries for the more recent great floods, and shows that it is the exception rather than the rule that great floods in the lower Mississippi are caused by high water in all of the tributary basins.

TABLE 14.—*Number of days above flood stage and dates*

Station	River	Dates above flood stage	Number of days above flood stage	Flood stage	Crest stage	Date of crest
				Feet	*Feet*	
Parkers Landing, Pa	Allegheny	Jan. 25–Jan. 25	1	20	21.2	Jan. 25.
Lock No. 4	Monongahela	do	1	30	30.0	Do.
Lock No. 7	Muskingum	Jan. 15–Jan. 30	16	22	[1] 36.0	Jan. 26.
Creston, W. Va	Little Kanawha	Jan. 23–Jan. 25	3	20	22.8	Jan. 23.
Chillicothe, Ohio	Scioto	Jan. 15–Jan. 28	14	16	27.9	Do.
Falmouth, Ky	Licking	Jan. 21–Jan. 27	7	28	41.4	Do.
Franklin, Ohio	Miami	Jan. 22–Jan. 22	1	16	16.7	Jan. 22.
Lock No. 4	Kentucky	Jan. 18–Jan. 29	12	31	47.6	Jan. 25.
Lock No. 4	Green	Jan. 11–Feb. 4	25	33	59.0	Jan. 24.
Hazleton, Ind	White	Jan. 10–Feb. 17	39	16	31.6	Jan. 22.
Vincennes, Ind	Wabash	Jan. 12–Feb. 4	24	14	22.8	Do.
Mount Carmel, Ill	do	Jan. 13–Feb. 9	28	19	27.0	Jan. 23.
Burnside, Ky	Cumberland	Jan. 3–Jan. 3	1	50	54.3	Jan. 3.
Clarksville, Tenn	do	Jan. 5–Jan. 12 Jan. 17–Feb. 6	29	46	49.7 65.6	Jan. 11. Jan. 25.
Chattanooga, Tenn	Tennessee	Jan. 3–Jan. 6	4	30	33.0	Jan. 4.
Florence, Ala	do	Jan. 3–Jan. 8 Jan. 25–Jan. 28	10	18	20.1 19.2	Do. Jan. 26.
Johnsonville, Tenn	do	Jan. 6–Jan. 13 Jan. 17–Feb. 9	32	31	32.0 41.0	Jan. 8. Jan. 25.
Pittsburgh, Pa	Ohio	Jan. 18–Jan. 20 Jan. 21–Jan. 27	10	25	28.1 34.5	Jan. 19. Jan. 26.
Dam No. 12	do	Jan. 22–Jan. 28	7	36	48.7	Do.
Dam No. 28	do	Jan. 19–Feb. 2	15	50	69.4	Jan. 27.
Portsmouth, Ohio	do	Jan. 18–Feb. 3	17	50	74.2	Do.
Dam No. 33	do	Jan. 18–Feb. 4	18	50	75.3	Do.
Cincinnati, Ohio	do	Jan. 18–Feb. 5	19	52	80.0	Jan. 26.
Dam No. 39	do	do	19	48	73.5	Do.
Louisville, Ky., upper gage	do	Jan. 16–Feb. 7	23	28	57.15	Jan. 27.
Dam No. 44	do	Jan. 15–Feb. 8	25	53	84.2	Do.
Dam No. 45	do	do	25	47	68.9	Jan. 28.
Dam No. 46	do	Jan. 16–Feb. 10	26	41	54.8	Jan. 29–30.
Evansville, Ind	do	Jan. 10–Feb. 19	41	35	53.75	Jan. 31–Feb. 1.
Shawneetown, Ill	do	Jan. 8–Feb. 23	47	33	65.5	Feb. 2.
Paducah, Ky	do	Jan. 10–Feb. 22	44	39	60.6	Do.
Cairo, Ill	do	Jan. 9–Feb. 27	50	40	59.5	Feb. 3–4
Parkin, Ark	St. Francis	Jan. 22–Mar. 4	32	28	34.3	Feb. 4–6.
Greenwood, Miss	Yazoo	Feb. 2–Feb. 16	15	35	36.4	Feb. 9.
Van Buren, Ark	Arkansas	Jan. 17–Jan. 17	1	22	22.0	Jan. 17.
Alexandria, La	Red	Jan. 27–Feb. 5	10	32	33.0	Feb. 2.
New Madrid, Mo	Mississippi	Jan. 13–Feb. 26	45	34	47.9	Feb. 2–5.
Memphis, Tenn	do	Jan. 20–Mar. 1	41	34	48.7	Feb. 10.
Helena, Ark	do	Jan. 22–Mar. 6	44	44	60.2	Feb. 12–14.
Arkansas City, Ark	do	Jan. 27–Mar. 8	41	42	53.8	Feb. 12–15.
Greenville, Miss	do	Jan. 24–Mar. 12	48	36	52.2	Feb. 15.
Vicksburg, Miss	do	Jan. 29–Mar. 14	45	43	53.2	Feb. 21.
Natchez, Miss	do	Feb. 1–Mar. 17	45	48	58.0	Feb. 21–25.
Angola, La	do	Feb. 1–Mar. 22	50	45	55.5	Feb. 27–28.
Baton Rouge, La	do	Feb. 2–Mar. 23	50	35	45.0	Feb. 28.
Donaldsonville, La	do	Feb. 3–Mar. 22	48	28	34.5	Feb. 27.
Reserve, La	do	Feb. 5–Mar. 20	44	22	25.6	Feb. 26.
New Orleans, La	do	Feb. 7–Mar. 19	41	17	19.3	Feb. 28.
Simmesport, La	Atchafalaya	Feb. 6–Mar. 22	45	41	49.3	Mar. 1–4.
Atchafalaya, La	do	Feb. 13–Mar. 21	37	25	25.9	Mar. 7–9.

[1] Estimated.

TABLE 15.—*Maximum river stages, lower Mississippi River and tributaries, high-water years, 1912–37*

Station	River	Flood stage	1912		1913		1916		1922		1927		1929		1937	
			Stage	Date	Stage	Date	Stage	Date	Stage	Date	Stage	Date	Stage	Date	Stage	Date
		Feet	*Feet*		*Feet*		*Feet*		*Feet*		*Feet*		*Feet*		*Feet*	
St. Louis, Mo	Mississippi	30	30.8	Apr. 5	27.2	Apr. 16	31.5	Jan. 31	34.0	Apr. 19	36.1	Apr. 26	34.6 33.3	Apr. 27 May 20	12.2 18.8	Feb. 5 Feb. 25
Cape Girardeau, Mo	do	32	35.0	Apr. 7	31.8	Apr. 12	36.4	Feb. 3	38.0	Apr. 21	40.0	Apr. 20	36.9 37.4	Apr. 29 May 22	26.7 27.5	Jan. 26 Feb. 6
Paducah, Ky	Ohio	39	49.9	Apr. 8	54.3	Apr. 7	45.7 45.0	Jan. 18 Feb. 9	48.8 44.0	Mar. 24 Apr. 25	47.2	Apr. 18	43.9	May 16	60.6	Feb. 2
Cairo, Ill	do	40	54.0	Apr. 6	54.7	Apr. 4, 7	53.4	Feb. 4	53.6 53.5	Mar. 25 Apr. 25	56.4	Apr. 20	52.7	May 19	59.5	Feb. 3
Memphis, Tenn.[1]	Mississippi	34	45.3	do	46.6	Apr. 9	43.5	Feb. 9	42.6 42.3	Mar. 31 Apr. 29	46.0	Apr. 23	41.7	May 26	50.3	Feb. 10
Parkin, Ark.[2]	St. Francis	28	39.4	Apr. 21	40.2	Apr. 20	29.6	do	28.5	Apr. 10	33.3	Apr. 30	27.4	May 28	34.3	Feb. 4
Helena, Ark	Mississippi	44	54.4	do	55.2	Apr. 22	53.4	Feb. 11	52.3 53.1	Apr. 3 May 3	56.8	Apr. 26	52.6	do	60.2	Feb. 12
Newport, Ark	White	26	27.7	Apr. 4	25.5 24.4	Mar. 30 Apr. 14	34.3	Feb. 1	26.2	Apr. 13	35.6	Apr. 16	29.5	May 12	30.7	Jan. 18
Little Rock, Ark	Arkansas	23	22.3 24.0	Apr. 3 May 4	17.3	Apr. 13	27.3	Feb. 2	23.1	Apr. 14	33.0	Apr. 20	23.3	May 19	18.8 17.6	Do. Feb. 3
Arkansas City, Ark	Mississippi	42	55.4	Apr. 12	55.1	Apr. 21	56.4	Feb. 10	58.0	Apr. 22	60.4	Apr. 21	58.8	May 29	53.8	Feb. 12
Greenwood, Miss	Yazoo	35	38.2	Apr. 5	33.3	Apr. 16	31.4	Feb. 13	35.6	Mar. 22	33.0	May 7	20.9	June 1	36.4	Feb. 9
Vicksburg, Miss	Mississippi	43	52.1	Apr. 12	52.3	Apr. 27	53.9	Feb. 14	55.0	Apr. 28	58.6	May 4	55.1	June 6	53.2	Feb. 21
Natchez, Miss	do	48	51.4	Apr. 14	52.4	Apr. 26	53.6	Feb. 15	55.3	Apr. 26	56.6	May 5	54.5	June 5	58.0	Do.
Monroe, La	Ouachita	40	46.2	Apr. 22	36.9	Apr. 29	40.6	Feb. 19	41.4	Apr. 21	48.2	May 4	26.3	May 6	44.7	Feb. 9
Shreveport, La	Red	39	29.4	Apr. 14	20.2	Apr. 15	35.5	Feb. 10	30.6	Apr. 12	37.4	Apr. 29	27.5	May 27	23.2	Jan. 29
Alexandria, La	do	32	33.6	Apr. 22	24.2	Apr. 6	36.8	Feb. 16	37.1	Apr. 18	42.4	May 8	33.3	May 29	33.0	Feb. 2
New Orleans La	Mississippi	17	21.1	May 11	19.5	May 8	20.1	Feb. 28	21.3	Apr. 25	21.0	Apr. 25	20.0	June 9	19.3	Feb. 28
Simmesport. La	Atchafalaya	41	50.1	do	46.9	May 9	48.5	Mar. 1	51.6	May 16	53.4	May 16	46.4	June 12	49.3	Mar. 1

[1] Beale Street gage.
[2] Records prior to 1937 obtained from Corps of Engineers, U. S. Army.

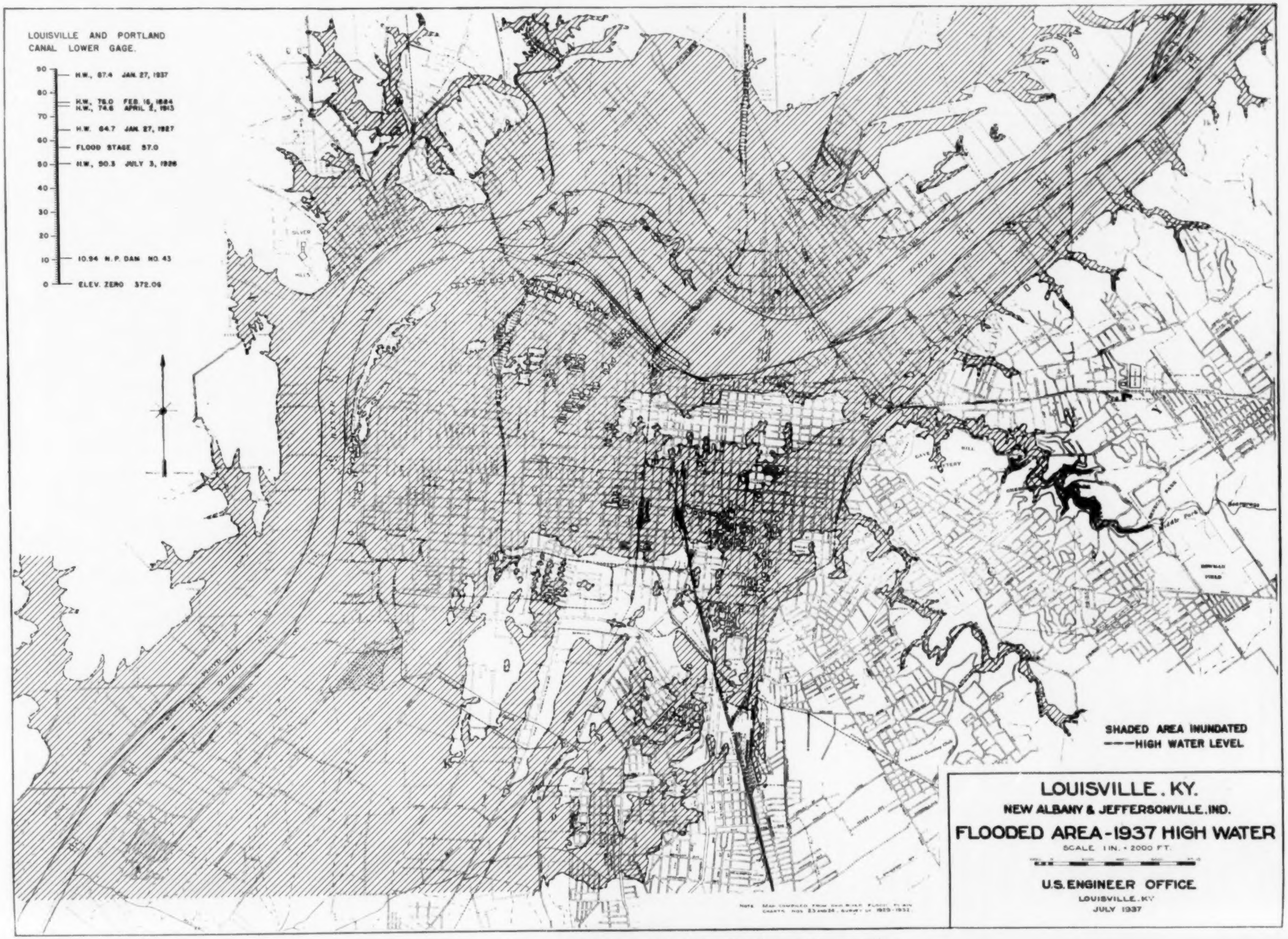

FIGURE 29.—Map showing flooded area in Louisville, Ky., January–February 1937.

Official photograph, U. S. Army Air Corps.

A.—Outskirts of Cincinnati, Ohio, January 26, 1937, at crest stage, 80 feet.

Official photograph, U. S. Army Air Corps.

B.—Downtown Cincinnati, Ohio (view from the Ohio River), January 23, 1937. River stage, 72.6 feet.

Official photograph, U. S. Army Air Corps.

A.—Kentucky State Fair Grounds, Louisville, Ky., January 25, 1937. Water rose 2 feet higher.

Official photograph, U. S. Army Air Corps.

B.—River front, Evansville, Ind., February 5, 1937, 4 days after the crest.

A.—Shawneetown, Ill., February 9, 1937, 7 days after the crest and stage more than 4 feet lower than the crest. River wall and levees were overtopped.

Official photograph. U. S. Army Air Corps.

B.—Paducah, Ky., February 5, 1937. River stage only a few tenths lower than the crest 3 days previous.

Courtesy Evansville Press.

A.—Harrisburg, Ill., more than 22 miles from the Ohio River.

American Red Cross photograph

B.—A view of some of the tents in the Red Cross refugee center at Forrest City, Ark., which sheltered, at one time, approximately 18,000 persons.

American Red Cross photograph.

A.—Creating an artificial break in the Mississippi River levee at the Birds Point-New Madrid spillway to relieve the situation in the lower Ohio and Mississippi Rivers.

Official photograph, U. S. Army Air Corps.

B.—View of the Ohio River levee just above Cairo, Ill., February 5, 1937, showing the raised levee.

American Red Cross photograph.

C.—Breaks in the levee at Bessie, Tenn., showing the waters flowing over the reinforcement on the revetment.

American Red Cross photograph.

D.—An air view of the break in the Birds Point-New Madrid spillway.

American Red Cross photograph.

A.—Typical scene in the flooded area.

American Red Cross photograph.

C.—Baltimore & Ohio Railroad washout at Cincinnati, Ohio.

Official photograph, U. S. Army Air Corps.

B.—Portsmouth, Ohio, February 6, 1937, after the flood waters had subsided.

D.—Cleaning up after the flood. The interior of a store in Evansville, Ind.

A recent study [11] indicates that while it is entirely possible for an intense storm to occur over portions of the Missouri, Ohio, and upper Mississippi Basins, there is no indication that such storm action could be so widespread as to cause excessive river discharges, simultaneously, from the entire drainage area, creating floods which would converge at Cairo and overwhelm the lower Mississippi River.

Excessive and widespread precipitation, causing floods in the Mississippi Valley, is due almost entirely to intense frontal action between polar continental and tropical Atlantic air masses. For rainfall to occur over large mass will retard and reduce the surface run-off, thereby diminishing the discharge.

On the other hand, when the line of frontal action between the polar and tropical air masses occupies a more northerly or northwesterly position the precipitation would be heaviest over the upper Mississippi and Missouri Basins. The tropical air mass, in this case, moves northward over the Ohio Basin, causing light to moderate precipitation of a showery type. At such times the discharges from the upper Mississippi and Missouri are greatest, while the discharge from the Ohio is only light or moderate.

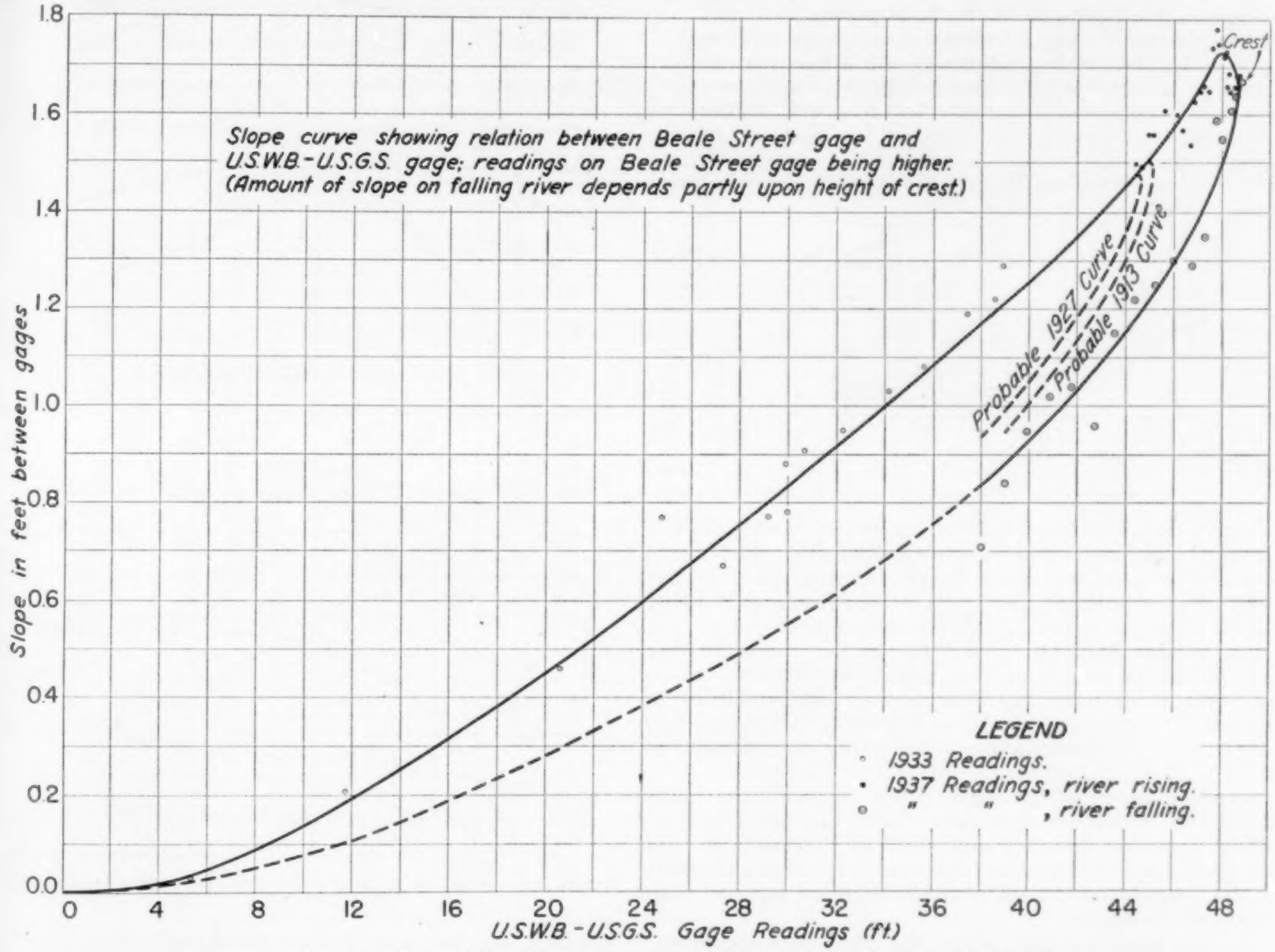

FIGURE 30.—Slope curve showing relation between Beale Street gage and Weather Bureau river gage, Memphis, Tenn.

drainage areas such as the lower Mississippi, upper Mississippi, Missouri, or Ohio in sufficient quantities to result in excessive floods, it is necessary for both the polar continental and tropical Atlantic air masses to be quite active over the basin affected. Therefore, in order to have intense air-mass action over the Ohio Basin, it is necessary for a cold, dry air mass originating in polar regions to invade the upper Mississippi and Missouri River Basins during its southeastward extension into the Ohio Valley. However, while intense rain is occurring over the Ohio, the presence of the polar air mass to the north and west will result in only light precipitation (mostly in the form of snow) over the upper Mississippi and Missouri Basins. In addition, low temperatures accompanying the polar air

While it is necessary for precipitation to occur almost simultaneously over the upper Mississippi, Missouri, and Ohio Basins in order to produce a synchronized flood at Cairo, it is entirely possible for rains to occur almost a month later over the Arkansas and Red Basins, creating flood crests in these streams which would coincide with the high water in the lower Mississippi originating in the upper Mississippi and Ohio Basins. This fact was demonstrated in the 1922 flood when the maximum discharge from the Ohio occurred in March and excessive rains fell on the Arkansas and Red Basins in April. The flood crests from the latter streams synchronized with the high water from the Ohio and produced a great flood in the extreme lower Mississippi. Practically the same conditions occurred in 1927.

The flood in the lower Mississippi River, January-February 1937.—While the greatest flood of record was devel-

[11] A Meteorological Analysis of the Possibility of the Coincidence of Maximum Flood Discharges from the Ohio, Mississippi, and Missouri Rivers. Corps of Engineers, U. S. Army—Weather Bureau Cooperative Studies, 1937.

oping in the Ohio River, the conditions in the Mississippi were favorable for receiving and disposing of this unprecedented discharge. At the beginning of the rise in the Ohio the stages in the Mississippi River were unusually low. The States drained by the Missouri, White, Arkansas, and Red Rivers had been experiencing drought for 3 years, and these streams were contributing very little water to the flow of the lower river. The stages on the Mississippi and tributaries on January 1, 21, and February 10 are shown in the following table. The low stages of 9.7 feet at Memphis and 2.3 feet at New Orleans on January 1 indicate the magnitude of available channel storage at the beginning of the flood period.

Precipitation during January was excessive over most of the middle and lower portions of the immediate Mississippi River. Amounts in excess of 20 inches were recorded between December 25–January 25 at several stations in Arkansas.

River stages on Mississippi River and tributaries on three dates during 1937 flood

Station	River	Flood stage	Jan. 1	Jan. 21	Feb. 10
		Feet	*Feet*	*Feet*	*Feet*
Hermann, Mo.	Missouri	21	4.2	5.8	10.0
St. Louis, Mo.	Mississippi	30	.9	8.5	10.2
Cape Girardeau, Mo.	do.	32	10.3	23.2	25.7
Memphis, Tenn.	do.	34	9.7	34.7	48.7
Newport, Ark.	White	26	11.8	29.4	22.2
Little Rock, Ark.	Arkansas	23	8.9	15.4	7.5
Vicksburg, Miss.	Mississippi	43	5.8	35.0	50.8
Monroe, La.	Ouachita	40	14.9	30.4	44.7
Alexandria, La.	Red	32	6.5	29.3	28.0
New Orleans, La.	Mississippi	17	2.3	11.1	17.6
Simmesport, La.	Atchafalaya	41	6.8	30.2	43.6

Above St. Louis the precipitation during January in the Missouri and Mississippi Basins was mainly in the form of snow. Temperatures were below freezing most of the time. Consequently, there was little run-off into either the Missouri or Mississippi Rivers above that point.

The Illinois, Meramec, and Arkansas Rivers rose to only light flood; the Red, Ouachita, and Yazoo Rivers to moderate flood, and the St. Francis and White Rivers to moderately heavy flood. Thus, the lower Mississippi was not receiving an unusual amount of water, except from the Ohio.

Another factor mitigating extreme stages in the lower Mississippi was the lack of precipitation in the Arkansas, White, and Red Basins during most of February, so that the discharge from these streams was reduced considerably by the time the flood peak in the Mississippi reached their points of discharge.

Despite favorable conditions, the lower Mississippi was called on to carry a flood of well over 2,000,000 second-feet. The recently improved levee system successfully held the water within bounds, except in backwater areas of the tributaries. Improved channel conditions between the Arkansas and Red Rivers no doubt contributed to an increased carrying capacity for that reach of the river.

The Bonnet Carré spillway, 23 miles above New Orleans, was put into operation by the United States Engineers late in January when it became apparent that the oncoming flood waters would raise the stage at New Orleans above 20 feet. The floodway diverted a maximum of about 200,000 second-feet into Lake Pontchartrain and held the crest at New Orleans to 19.3 feet. Without the relief afforded by the spillway, it is estimated that the stage at New Orleans would have been about 3 feet higher.

THE RELATIONSHIP OF THE RIVER GAGES AT MEMPHIS, TENN.

For many years prior to 1932 river gage readings at Memphis were made by the Weather Bureau on a gage known locally as the "Beale Street gage." Since September 1, 1932, readings have been made on a gage located about 1.4 miles downstream. The zero of the new gage is set at the same elevation as the zero of the Beale Street gage, namely, 183.91 feet, but, due to the slope in the river,

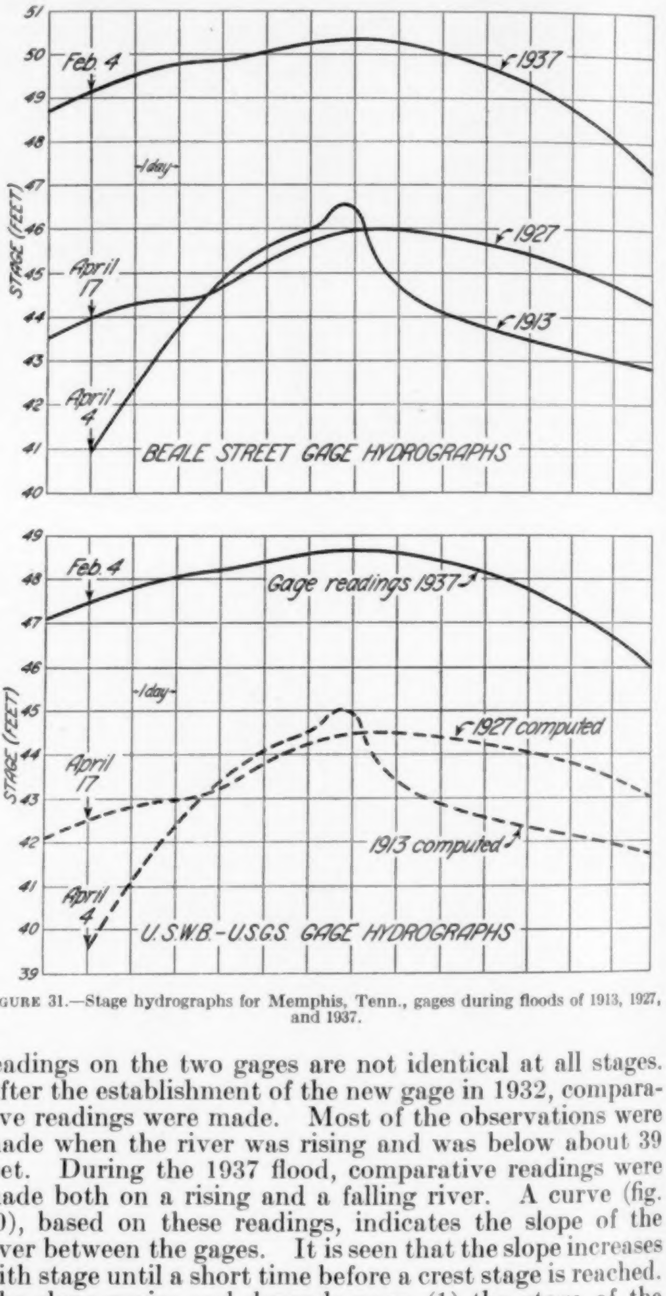

FIGURE 31.—Stage hydrographs for Memphis, Tenn., gages during floods of 1913, 1927, and 1937.

readings on the two gages are not identical at all stages. After the establishment of the new gage in 1932, comparative readings were made. Most of the observations were made when the river was rising and was below about 39 feet. During the 1937 flood, comparative readings were made both on a rising and a falling river. A curve (fig. 30), based on these readings, indicates the slope of the river between the gages. It is seen that the slope increases with stage until a short time before a crest stage is reached. The slope varies and depends upon (1) the stage of the river, (2) the character of the rise and fall, and (3) whether the stage is rising or falling. For these reasons, and also because the high water marks of 1913 and 1927 were established when the Beale Street gage was in use, comparative readings were made in the 1937 flood. Inasmuch as the 1937 flood reached the highest stage of record at Memphis,

it is possible to base future stage heights on the record of the newer gage only.

The actual stage hydrographs for the Beale Street gage during the floods of 1913, 1927, and 1937, and for the present Weather Bureau gage during the 1937 flood, are shown in figure 31. Using the slope curve in figure 30, hydrographs for the new Weather Bureau gage during the 1913 and 1927 floods have been computed from the Beale Street gage readings.

FLOOD FORECASTS AND WARNINGS

The flood forecasting service of the Weather Bureau throughout the period of the flood functioned satisfactorily. From the beginning of the flood period, warnings and river stage forecasts were issued regularly at the various forecast centers and given wide distribution. On account of the duration of excessive rainfall and its erratic distribution throughout the storm period, announcements of the final crest-stage forecasts for the Ohio above Cincinnati could not be made far in advance because the river ceased to rise in that section within 30 hours after the rain ended. Below Cincinnati, final crest-stage forecasts were issued for periods ranging from 3 days at Louisville, 6 days at Evansville, 9 days at Cairo, and 14 days at Memphis to 31 days at New Orleans. Forecasts were promptly relayed to the American Red Cross and Federal, State and local governmental agencies, and to all public and private interests affected. All available means of communication were used, including radio broadcasting stations, telegraph and telephone companies, and newspapers, which cooperated freely in the dissemination of forecasts and warnings.

The effectiveness of the work of the Red Cross and cooperating agencies, in rescuing and affording relief to stricken families, is shown in the low death rate in this flood. With few exceptions, all people seriously affected by the flood were cared for by the Red Cross. The official records of this organization list a total of only 137 deaths among these people, due to drowning, exposure, and other hardships attributed directly to the flood.